



# FCMAT

FISCAL CRISIS & MANAGEMENT  
ASSISTANCE TEAM

CSIS California School Information Services

# Metropolitan Education District

## Technology Review

June 17, 2016



**Joel D. Montero**  
Chief Executive Officer







June 17, 2016

Alyssa Lynch, Superintendent  
Metropolitan Education District  
760 Hillsdale Avenue  
San Jose, CA 95136

Dear Superintendent Lynch:

In October 2015, the Metropolitan Education District and the Fiscal Crisis and Management Assistance Team (FCMAT) entered into an agreement for a review of the district's technology services. Specifically, the agreement states that FCMAT will perform the following:

1. Conduct a comprehensive analysis of the district's state of technology including leadership, hardware, software, department staffing, and technology use. Interview principals, department directors and classified staff to gather data on the software applications and hardware utilized. Review and analyze the district's technology master plan with an emphasis on the integration with the Local Control Accountability Plan (LCAP).
2. Analyze the status of the following:
  - a. Project management
  - b. Infrastructure planning , deployment, and maintenance
  - c. Help desk system and ticketing process
  - d. Website development and support with an emphasis on content management, board and social media policies
  - e. Hardware installation and setup
  - f. Application software used at district and site levels, including, but not limited to, the Student Information System and Automated Attendance Dialer
3. Review the job descriptions, skill level, and staffing of the technology department, including any site-level support.
4. Review professional development methodology for technology department staff.

**FCMAT**

Joel D. Montero, Chief Executive Officer

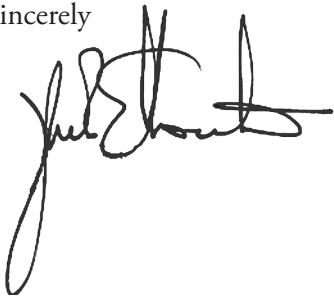
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Administrative Agent: Christine L. Frazier - Office of Kern County Superintendent of Schools

5. Review life-cycle management of devices including acquisition, disposal and inventory management.
6. Make staffing recommendations based on the support level necessary to meet the district's technology requirements.
7. Review the network design for systems and data safeguards against a catastrophic event or security breach.
8. Review the processes or planning used to ensure that hardware and software assets are up to date.

This report contains the study team's findings and recommendations.

We appreciate the opportunity to serve you and we extend thanks to all the staff of the Metropolitan Education District for their cooperation and assistance during fieldwork.

Sincerely

A handwritten signature in black ink, appearing to read 'Joel D. Montero', with a stylized flourish at the end.

Joel D. Montero  
Chief Executive Officer

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# About FCMAT

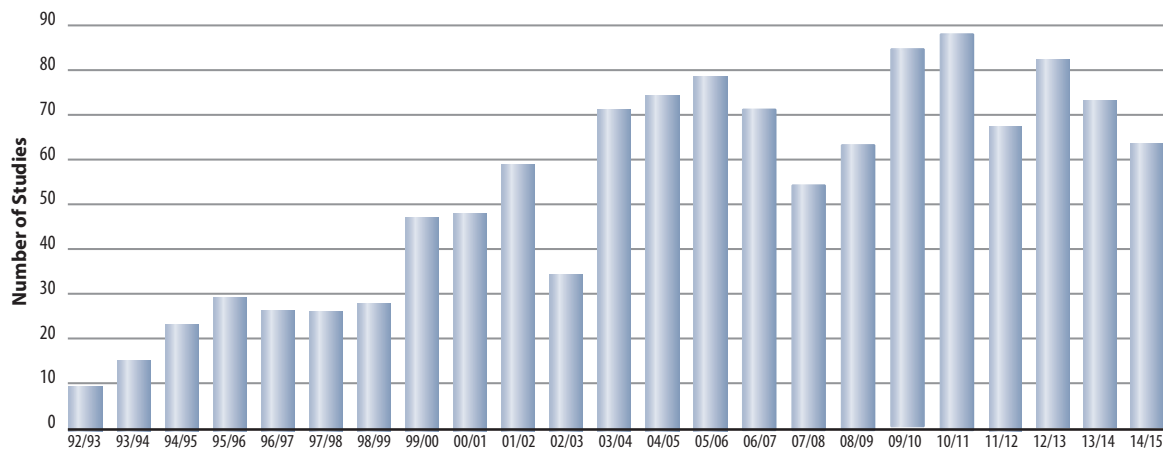
FCMAT’s primary mission is to assist California’s local K-14 educational agencies to identify, prevent, and resolve financial, human resources and data management challenges. FCMAT provides fiscal and data management assistance, professional development training, product development and other related school business and data services. FCMAT’s fiscal and management assistance services are used not just to help avert fiscal crisis, but to promote sound financial practices, support the training and development of chief business officials and help to create efficient organizational operations. FCMAT’s data management services are used to help local educational agencies (LEAs) meet state reporting responsibilities, improve data quality, and inform instructional program decisions.

FCMAT may be requested to provide fiscal crisis or management assistance by a school district, charter school, community college, county office of education, the state Superintendent of Public Instruction, or the Legislature.

When a request or assignment is received, FCMAT assembles a study team that works closely with the LEA to define the scope of work, conduct on-site fieldwork and provide a written report with findings and recommendations to help resolve issues, overcome challenges and plan for the future.

FCMAT has continued to make adjustments in the types of support provided based on the changing dynamics of K-14 LEAs and the implementation of major educational reforms.

**Studies by Fiscal Year**



FCMAT also develops and provides numerous publications, software tools, workshops and professional development opportunities to help LEAs operate more effectively and fulfill their fiscal oversight and data management responsibilities. The California School Information Services (CSIS) division of FCMAT assists the California Department of Education with the implementation of the California Longitudinal Pupil Achievement Data System (CALPADS). CSIS also hosts and maintains the Ed-Data website ([www.ed-data.org](http://www.ed-data.org)) and provides technical expertise to the Ed-Data partnership: the California Department of Education, EdSource and FCMAT.

FCMAT was created by Assembly Bill (AB) 1200 in 1992 to assist LEAs to meet and sustain their financial obligations. AB 107 in 1997 charged FCMAT with responsibility for CSIS and its state-wide data management work. AB 1115 in 1999 codified CSIS’ mission.

AB 1200 is also a statewide plan for county offices of education and school districts to work together locally to improve fiscal procedures and accountability standards. AB 2756 (2004) provides specific responsibilities to FCMAT with regard to districts that have received emergency state loans.

In January 2006, Senate Bill 430 (charter schools) and AB 1366 (community colleges) became law and expanded FCMAT's services to those types of LEAs.

Since 1992, FCMAT has been engaged to perform more than 1,000 reviews for LEAs, including school districts, county offices of education, charter schools and community colleges. The Kern County Superintendent of Schools is the administrative agent for FCMAT. The team is led by Joel D. Montero, Chief Executive Officer, with funding derived through appropriations in the state budget and a modest fee schedule for charges to requesting agencies.



# Introduction

## Background

The Metropolitan Education District is located in San Jose and provides career technical education at Silicon Valley Career Technical Education and adult education at Silicon Valley Adult Education. Courses offered at the former school include training in more than 32 occupational areas including electronics, manufacturing, business, automotive, construction, and health occupations. The courses offered at the latter school range from basic skills in math, reading and writing, English-as-a-second-language (ESL) citizenship to career technical (vocational) certificate programs.

These two schools share one campus. The district serves more than 11,000 students and six school districts including the East Side Union, Campbell Union, Los Gatos-Saratoga Joint Union, and Milpitas Unified high school districts and the Santa Clara and San Jose unified school districts.

## Study Team

The study team was composed of the following members:

Scott Sexsmith  
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Danville, CA

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FCMAT Technical Writer  
Bakersfield, CA

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Director of Information Technology  
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\*As members of this study team, these consultants were not representing their respective employers but were working solely as independent contractors for FCMAT. Each team member reviewed the draft report to confirm its accuracy and to achieve consensus on the final recommendations.

## Study Guidelines

In October 2015 the Metropolitan Education District requested that FCMAT review its technology support services. FCMAT visited the district on January 12-14, 2016 to conduct interviews, collect data and review documents. This report is the result of those activities and is divided into the following sections:

- Executive Summary
- Technology Staffing Overview
- Technology Planning, Management and Leadership
- Professional Development
- Services
- Network Infrastructure
- Disaster Recovery
- Technology Support Staffing and Organization
- Appendix

In writing its reports, FCMAT uses the Associated Press Stylebook, a comprehensive guide to usage and accepted style that emphasizes conciseness and clarity. In addition, this guide emphasizes plain language, discourages the use of jargon and capitalizes relatively few terms.

# Executive Summary

K-12 education continues to change rapidly as technology becomes more included in the curriculum and in daily classroom use. Districts are spending large amounts of human and financial resources to help improve student learning using technology. The use of technology needs to be carefully guided using best practices and researched-based methods. In addition to a carefully developed technology plan, the effort to use technology effectively in the classroom must be led by a qualified certificated employee, often referred to as a director of educational technology.

Working with an astute technology professional such as a chief technology officer (CTO), a district can create plans to select products, train staff, implement software and hardware, and review effectiveness. The CTO can ensure that the technical resources are available to support technologies and training plans through careful use of financial and human resources.

The state approved major changes to the K-12 curriculum with the addition of the Common Core State Standards and online Smarter Balanced Assessments, both of which require considerable efforts to properly integrate technology into the curriculum and classroom.

## Technology Support Staffing Overview

The Metropolitan Education District Information Technology (IT) Department serves adult education and technical education center programs and is led by a director of information technology who reports to the chief business officer. The department consists of a network specialist lead, systems support specialist/district registrar, webmaster/database analyst, and two computer support technicians, one of whom is a temporary employee. All IT staff report to the director and are full-time, 12-month employees.

## Technology Planning, Management and Leadership

The district does not have a current technology plan. Despite administration requesting that the director of information technology develop a plan, the document is still in draft form and incomplete. Without a comprehensive plan, the two schools implement technology independent of each other, without clear and documented needs and expected outcomes. This lack of planning and independent decision-making increases the workload on the IT Department as it struggles to respond to newly introduced technologies.

Many large technology projects such as the replacement of the student information system and the new \$6 million dollar California Career Pathways Trust (CCPT) grant originated with little or no input from the Technology Department. This resulted in reactive support from the department instead of careful planning and coordinated efforts.

## Professional Development

Professional development for IT staff is limited, with few opportunities for attending classes or workshops. Annual reviews of individual IT staff do not include a personal growth/professional development component designed to improve needed knowledge and skills. A reasonable budget exists for IT professional development, and almost \$13,000 remains as of January 12, 2016.

## Services

The method of installing software on computing devices is manual and lacks an automated method for installing updates, patches, and complete system reloads. This results in increased workloads for IT staff and frustrates end users as they wait for technology support. As of January the district had 255 outstanding requests for technology support, many months old.

The district lacks a technology replacement plan. These plans consider the anticipated life span and replacement costs of network infrastructure components such as routers, switches, servers, storage, firewalls, web filtering appliances, etc. They then divide these costs into annual anticipated expenses to keep the overall network updated and reliable. Without a technology replacement plan, expenses can be unanticipated and difficult to budget and fund.

The processes for updating web content are centralized to the webmaster/database analyst position in the IT Department. This often results in outdated content and delays the posting of urgent information on the web. To alleviate this problem, many districts use a content management system to distribute the maintenance of content to individual departments.

FCMAT tested the district's web content filtering using computers that students regularly utilize and easily accessed inappropriate material. This is a result of improper configuration of the filtering system.

## Network Infrastructure

The district uses Microsoft Exchange for email services and uses two exchange servers with a front-end load balancer. The district does not need a tandem Exchange server environment; one server is enough for most districts of this size. Removing the load balancer and one exchange server would make the entire email system less costly to maintain.

## Disaster Recovery

The district does not have a comprehensive disaster recovery plan to protect all data and critical systems and does not perform manual data recovery and restore tests to ensure critical systems and data can be retrieved in a timely manner, protecting operational continuity in case of an emergency.

A disaster recovery plan is needed for every district regardless of size. School districts increasingly depend on stable, fast, and recoverable IT systems. It is important to ensure that certain critical data systems can be recovered and brought back online within an acceptable amount of time.

## Technology Support Staffing and Organization

FCMAT recommends minor changes to staffing levels and the organization of the IT Department. They include the following:

- Redistribute some of the workload of mobile device management among IT staff.
- Replace the temporary computer network technician with a full-time district employee.

# Findings and Recommendations

## Technology Staffing Overview

The Metropolitan Education District Information Technology (IT) Department serves Silicon Valley Career Technical Education Center and Silicon Valley Adult Education programs and is led by a director of information technology who reports to the chief business officer. The department consists of a network specialist lead, systems support specialist/district registrar, webmaster/database analyst, and two computer support technicians, one of whom is a temporary employee. All IT staff report to the director and are full-time, 12-month employees. Staffing is discussed throughout this report and in detail in the Technology Support Staffing and Organization section.

## Technology Planning, Management, and Leadership

### Technology Master Plan

A current district technology plan was not available for review. Administrators stated that the director has been asked to develop a districtwide plan that it is still in draft form, and they expressed frustration at the length of time the document is taking to complete. Staff indicated many areas of concern could be addressed in a valid technology master plan, including infrastructure and network improvements, data systems alignment and integration, and educational technology.

Silicon Valley Career Technical Education Center and Silicon Valley Adult Education each have a technology committee with meetings that are attended by the director of IT and the director of curriculum, instruction and accountability. There is no district-level technology committee. In the IT Department, staff meetings occur once or twice per month and are organized and led by the director of IT. In addition, the director of IT meets one-to-one weekly with the network specialist and the chief business officer.

Individual staff have successfully applied for grants to fund innovative programs and classes, and some are working on partnerships with area industry and technology experts. Administrators and classroom teachers make strategic decisions without the participation and input from IT. Most staff stated that the environment is not as “high-tech” as they want and cited examples of poor quality wireless service, difficult access to resources, disorganized software and systems adoptions, and lack of awareness about grants and new initiatives. The success of innovations and new curricula depends on individuals or a small group of staff rather than districtwide or schoolwide initiatives.

Without a technology plan, each school defines its own objectives and strategies according to specific needs or based on the experience of administrators at their previous districts. As a result, each school competes for scarce technology support and financial resources, the district misses opportunities to standardize, and initiatives begun in one school may not meet the needs of the other. Without the guidance of a technology master plan or acceptance by those affected, new initiatives may fail or have poor results.

In successful system implementation of new information systems, online curricula or grant proposals, IT is included in the process from the onset, and the project aligns with an overall technology master plan. Timelines and training requirements can then be anticipated, and fiscal and human resources allocated appropriately, helping ensure a successful rollout and sustainability.

All activities related to implementing and supporting educational and administrative systems should be carefully planned and monitored, from goal setting, to grant writing, equipment ordering, delivery, implementation and training. Technology staff should be included at every level.

The shift from isolated instances of innovation to comprehensive innovation throughout the organization requires a highly cooperative, collaborative team operating within the framework of a plan. In well-functioning districts, the technology master plan is a key component of the operation because of the vision, goals and objectives it outlines and because the process of developing the plan involves a collaborative effort representing all those affected.

Metropolitan Education District Board Policy 0440 states:

The Superintendent or designee shall develop, for Board approval, a comprehensive three-year technology plan based on an assessment of current uses of technology in the district and an identification of future needs. The Superintendent or designee may appoint an advisory committee consisting of a variety of staff and community stakeholders to assist with the development of the technology plan.

The plan shall be integrated into the district's vision and goals for student learning and shall contain research-based strategies and methods for the effective use of technology. When required for state or federal grant programs in which the district participates, the plan shall also address all components required for receipt of such grants.

Metropolitan Education District Administrative Regulation 0440 in part states:

The district's technology plan shall address, at a minimum, the following components:

1. Background Information: A guide to the district's use of technology for a 3 year period, including:
  - a. Specific starting and ending dates of the plan
  - b. An overview of the district's location and demographics
  - c. A description of how stakeholders from the district and community were involved in the planning process
  - d. A description of the relevant research behind the strategies and/or methods in the plan and how the research supports the plan's curricular and professional development goals

The administrative regulation and board policy were updated in August 2015.

## Recommendations

*The district should:*

1. Review and update the district technology plan regularly during its three-year term.
2. Follow the specific guidelines described in the administrative regulation to develop a three-year technology master plan.
3. Form a district technology committee in addition to the two site committees to review and complete the draft technology plan with a new three-year vision that expresses the district's commitment to using technology in the classroom to improve learning and a process for continuously updating the goals and strategies. The committee should also meet periodically to assess the plan's progress and address systemwide issues such as grants and partnerships sought by the schools or district.
4. Use software such as the International Society of Technology in Education's Lead & Transform Diagnostic Tool (<http://www.iste.org/lead/lead-transform/diagnostic-tool>) to generate a report that will help guide technology integration planning.
5. Ensure the Silicon Valley Career Technical Education Center and Silicon Valley Adult Education continue their respective technology meetings to discuss issues and plans specific to each school.
6. Align the technology master plan with the district facilities, administrative, and educational plans to ensure successful completion of the recommended action steps and optimize district resources.
7. Establish a schedule for district and school technology committee meetings.

## Project Management and Leadership

*Because the director of IT was unavailable for interviews, much of this section is based on documents reviewed and interviews/observations during the team's visit.*

Interviews indicated the IT Department lacks sound management and leadership. Many of those interviewed mentioned a lack of communication and planning, slow service response and a general perception that the director of information technology is detached from the needs of the staff and students.

Many staff reported that the district leadership had been forced into assisting with decisions and planning of projects that in most circumstances would be led by the director of IT or someone in the department. Two examples are the student information system (SIS) and a new \$6 million California Career Pathways Trust (CCPT) grant. The press release describes the technology focused grant as follows:

The MetroEd Consortium, which includes the Silicon Valley Career Technical Education Center (SVCTE Center), will use funds from this grant to add courses in its information technology sector in Cyber Security (new); Mobile App Design and Computer Coding (new); Cisco Academy; and Robotic and Drone Programming. It will also expand a variety of programs, including sports medicine, pharmacy technician, X-ray technician, radiology, firefighting, law enforcement, and legal careers.

Virtually no one from the IT Department was involved with either of these two extensive and important projects. The new SIS system was a large technical rollout of database technology that affects almost every person in the district. A new SIS system affects grades, teachers, administration, students and parents. IT should have been closely involved or led this project. The \$6 million grant received by the district depended heavily on technology. Yet interviewees indicated IT had almost no involvement in writing the grant or providing input on how the money would be spent. IT began to give input on the amount of money needed only after the grant was awarded.

Projects like this that affect all students and the entire district and operate primarily in the Technology Department should have IT involvement. Otherwise, the result could be implementation problems, lack of clearly defined outcomes resulting in additional work, or cost overruns.

Another issue that resulted from a lack of leadership or improper management was the fact that IT staff were allowed to take vacations on the week that school started. This is the busiest week of school and one of the more demanding times for IT. All IT staff regardless of position should work the week before school starts as well as the first and second weeks of school to resolve any technical problems that might interfere with a smooth opening.

The IT Department provides critical services throughout a school district and through its leadership has a direct influence on productivity, security, and communications. The department leader safeguards district technology and should have a management style that combines leadership with a service orientation. Effective IT leaders also stay involved in all aspects of district operations.

## Recommendations

*The district should:*

1. Ensure that the IT leader becomes more involved in everyday operational decisions and functions.
2. Revise IT leave policies to closely evaluate the impact of vacation near the start of school or during other critical times.



## Professional Development

The training opportunities available in the district are related to specific systems. The Silicon Valley Adult Education student information system Administrative Software Applications (ASAP) product implementation included training for users and system administrators, and the network systems specialist and webmaster/database administrator attended vendor training for the recently-acquired mobile device management system.

IT staff provide one-to-one training for users as requested. These are usually related to technology service requests. The systems support specialist/district registrar has developed quick user guides for the Harris School Solutions AIM product and the ASAP attendance systems to assist school office staff. Non-IT staff indicated that the IT director and other IT staff members have been available to teach systems and skills when asked.

Although IT staff cited a lack of funding for professional development, the 2015-16 IT Department budget indicates \$4,500 is available in travel and conferences and \$8,400 in staff development, which were still unencumbered as of January 12, 2016. The adult education budget has an additional unencumbered \$625 for travel and conferences.

All IT Department staff expressed an interest in additional professional development. IT staff must often learn new technologies and skills on their own. No established in-house training time is designated among Technology Department staff or with other district staff. Professional development for information technology staff does not appear to be a priority for the department, and the director of IT did not develop professional growth plans as part of an annual staff review.

Innovative instructional programs, especially in career technical education, require a support staff that is knowledgeable about program goals and the technology systems and devices required to support them. Understanding instructional goals and anticipating technology needs is critical for support staff. Many new teachers come to the district with ideas for innovative, high-tech curriculum and instructional environments, yet the IT staff is primarily committed to maintaining legacy networks and systems.

In high-performing technology departments, technical staff are encouraged and provided with time and support to obtain new skills, attend conferences and enroll in coursework. These increase knowledge and skills and improve job satisfaction. Training opportunities promote collaboration among staff in the district and with other districts and industry experts. When staff time away from the district is limited, many districts encourage enrollment in the wide variety of training courses available online, either self-managed or instructor-led. County offices of education are often good sources of experts and training opportunities and may be able to provide on-site training in the district. Educational conferences such as International Society for Technology in Education (ISTE) and the California Educational Technology Professionals Association (CETPA) offer opportunities for technical staff to interact with classroom educators and school administrators to learn about emerging technologies and changing classroom environments.

## Recommendations

*The district should:*

1. Encourage participation in outside professional development on relevant topics.
2. Provide financial support for staff to attend conferences and enroll in training or professional development courses related to their work.
3. Investigate the professional development offerings at the county office.
4. Include a personal growth/professional development plan component in annual employee reviews.
5. Institute regular, in-house training times for internal staff to cross-train or participate in online trainings.

## Services

### Hardware Installation and Setup

The district's process of hardware setup and installation is outdated. Manually configuring and implementing equipment is time consuming and frustrating to end users. The methods used to image new desktops and the practice of assigning static IP addresses to all desktops are dated, and the policy of maintaining Visio drawings of all rooms with information on each individual desktop is time-consuming and an ineffective use of staff time.

The reason for these problems is that the district has no centralized device control or management of any type. It has no central patch management, software inventory management, or centralized technology control systems. While the district has a simple Microsoft Active Directory (AD) implementation for Exchange and wireless authentication, none of the PCs, printers, users or students are part of the AD environment. AD is the central authentication system of a Microsoft network. It controls who has the security to sign in to a computer and the resources they can access such as files and email.

A non-AD environment in a Microsoft network can be labor-intensive and manual. When a change is made in the network, each desktop must be manually configured, one at a time. A properly installed AD system can result in a highly automated process for system maintenance.

The IT staff spends a great amount of time manually configuring desktops and assigning printers. Not having a properly configured AD environment also prevents users from accessing their programs and files from computers other than their own. As a result, users are limited to their own desktop computer because it is a one-of-a-kind machine configured just for them. If their computer crashes or they want to access their files from another location, they cannot easily log on to another computer in the domain and continue their work.

Every student PC has two local accounts; one for IT administration of the system and one for students. Staff PCs have a local account for the user and an IT administration account. Mapped network drives are setup manually by IT staff during installation and are mapped in file explorer along with printer assignments. Mapped network drives are the locations of staff and student files and coursework. This completely manual assignment of network resources is outdated, time-consuming and prone to failure. Using AD features is an easier and faster way to assign mapped drives.

Students log in to PCs with a single login account shared by all students. Most users store files on the computer's hard drive, which is not backed up, and while some users have network drives, many do not know they are available. Staff are not allowed administrator access to their own desktops, which causes issues when running certain software packages and prevents many program updates from being installed. Not installing updates can lead to virus and outside threats that exploit the network.

During interviews, several staff members indicated that 30 new Apple desktops were purchased before the start of school and have yet to be installed. The reason given was the installation of JMAF software, which would allow for the implementation of the new Apple desktops. JMAF is a software system that, once configured properly, automatically sets up and installs software on the Apple desktops. This allows the technician to set up many identical desktops at once, saving time. Unfortunately no one in the IT Department had been trained to use the JMAF system.

The best practice would have been to hire a consultant to set up the software and train the IT staff to use it. While this may initially be a bit more expensive, the fast start and training provided by these experts can be valuable. Technology changes quickly, and it is difficult for small IT departments to be familiar with all products. Occasionally using consultants can ensure that projects have a successful start, and IT staff learn to use and maintain new technologies.

Setting up group policy objects and login scripts is a simple way of making computer use easier. These policies can assign printers and network drives wherever the user can log in. This means a user can move from computer to computer, and after logging in, will have access to his or her own files and a nearby printer. Giving the users a network drive that is always available will allow files to be saved on the network for safe backup.

An effective Active Directory structure is the core of any Microsoft network. A network administrator should be able to add computers to the domain, assigning user IDs, create Group Policy Objects (GPO), create login scripts, and printer assignments from one location.

## Recommendations

*The district should:*

1. Invest in a central device management software package that will allow for patch management and software inventory of desktops and laptops with features equivalent to products such as LANDESK or Dell's KACE product.
2. Evaluate the possibility of hiring a consultant to set up Window Deployment Services to image PCs and laptops. The district already owns the licensing for this system through its CETPA and Microsoft Strategic Alliance (CAMSA) agreement.
3. Begin using more Active Directory features by placing all PC and laptops in the domain for central control, and at a minimum assign staff user IDs in the directory.
4. Begin using group policy objects to control equipment and printers and map documents to network drives, so little is stored on the local drive.
5. Give administrator access to staff PCs through group association in the Active Directory.
6. Hire a consultant to help with JMAF setup and Active Directory implementation.
7. Set up login scripts to improve automatic assignment of resources.
8. Discontinue the practice of Visio documentation of each and every PC on campus.

## Technology Support Requests

Staff are asked to submit requests for support through the district-developed online technology service request system (TSR). The webmaster/database analyst developed the system, allowing a user to submit, track and receive notice of the problem resolution. Staff has been encouraged to use the online system, and the number of requests submitted in this manner has increased. All IT staff track incoming TSRs and respond to those that require their attention. The director or network support specialist may also assign TSRs to specific individuals.

Although the system is accessible to all staff and provides automatic feedback when requests are resolved, some users indicated they are frustrated by long response times and lack of feedback. The TSR report from mid-January indicates 225 open work orders, some of which date from fall, 2014. In another example, a request for assistance placed in August had not had any response by January.

Users reported that some IT staff favor certain district employees, who as a result receive more prompt assistance than others. Those who have direct communication with someone in the IT Department reported they can bypass the TSR system, and their requests are handled promptly. The perception of favoritism is widespread among staff from the Silicon Valley Career Technical Education Center and Silicon Valley Adult Education.

Some staff said they are frustrated because they call the IT Department to inquire about a technology problem, but are directed to submit a TSR instead. Help-desk support is inconsistent. Some staff have stopped submitting any requests, but others report they receive prompt resolution when contacting technology directly. The responses about technology support range from satisfactory to unsatisfactory, and the number of unresolved and dated TSRs indicates a need to assess the process to improve response times and user confidence.

Many users indicated the IT Department is perceived as an obstacle to some new programs because of its slow responses or lack of responses to requests for assistance and network support. The nature of the curriculum in the Silicon Valley Career Technical Education Center requires state-of-the-art, high-performing computers and networks, and high-capacity storage for video production and other media classes.

The use of Apple computers has increased in the district, and the IT staff has not kept pace with this development. While computer/network technicians are skilled and experienced with PCs, they have little expertise in Apple technology. The network specialist lead and the webmaster/database systems analyst attended limited training to support some Apple-related products, but these opportunities have not been offered to the computer/network technicians.

IT staff may respond to requests for assistance in person or by using remote access. Computer support technicians use “ghosting” or cloning technology to image and repair PCs. They also utilize remote desktop access using the free Team Viewer product as much as possible.

IT staff indicated they are aware of user dissatisfaction. With the increase in requests for support, IT staff frequently work overtime, and all have difficulty using all their allotted vacation time. Several staff members have sometimes taken large blocks of time off for vacation at once or at the beginning of school. These absences of key staff during critical times have hindered operations because no one else is available to do the work in these staff members' absence.

While most districts utilize remote methods for technology support to reduce response times, high-performing, technology-rich schools realize the importance of strong working relationships among staff. These schools also make extra efforts to create opportunities for regular communi-

cation and collaboration between IT departments and district staff. The relatively small size of the Metropolitan Education District campus makes it possible to be on-site in classrooms when necessary. No classroom is further than a five-minute walk from the IT Department. In this environment, personal service and face-to-face interactions are possible and should be encouraged. Whether a technical problem can be solved or not with a classroom or office visit, there are benefits from establishing a culture of teamwork and collaboration.

## Recommendations

*The district should:*

1. Improve the TSR system by adding more feedback points in the workflow to give requestors more information about the status of their requests and projected timelines for resolution.
2. Establish weekly IT support staff meetings to review and distribute work orders and establish priorities.
3. Assign the appropriate IT staff to regularly participate in Silicon Valley Career Technical Education and Silicon Valley Adult Education staff meetings to develop strong collaborative relationships with colleagues and foster a culture of trust.
4. Provide relevant Apple training for computer/network support technicians.

## School Site Technical Support

The district has two assigned computer network technicians to work on school site equipment. This includes the installation of desktops, iPads, printers and other technology items in the classrooms. The district uses an in-house help-desk system developed and maintained by the webmaster/database analyst. The Maintenance and Human Resources departments also use this system. FCMAT requested an open TSR report and found 225 requests for technology support were open.

The computer network technicians work the TSR list based on priority and whoever gets the ticket first. If the technicians choose to perform remote support, they use the Team Viewer software product. Team Viewer is a free product, but has disadvantages for remote support. First, it cannot be remotely provided to the desktop and installed. Instead, the end user must install the software at the desktop and start it before a support person can help. Second, a personal identification number code is required to start the support session. Both of these can cause a considerable delay and hamper the remote support of desktops. The district would benefit from a support product that does not require end-user interaction for support of the desktops. This would help IT support staff provide remote support in a timelier manner.

Remote equipment support has improved considerably over the past decade. Now all servers come with remote management built into the system, and many new remote support software products are available for PCs and Apple products. Selecting a software support product and installing it on every district-owned computing device is the most effective way to support large networks.

## Recommendations

*The district should:*

1. Purchase a remote support package that allows IT support personnel to support a computing device without end-user interaction.
2. Ensure that the computer network technicians meet every morning with their supervisor and are assigned a list of TSRs to complete that day until the number of TSRs is decreased to a more reasonable level.

## Life-Cycle Management

The purchase of technology-related items is controlled through a combination of manual routing and the purchase order system. Requests for these items are first routed to the Technology Department for approval of the hardware or software. Requisitions with items that are not approved by the department are returned to the original requestor, and those that meet department approval are forwarded through the normal requisition process.

FCMAT reviewed the process of equipment disposal and found surplus equipment is properly removed from the asset inventory after board approval.

The FCMAT study team briefly reviewed the fixed asset master report, which is a report of all district fixed assets as of January 12, 2016. The technology-related fixed assets appear to be up to date and current with the exception of the old 3Com phones, which are still on the asset listing. The new ShoreTel phone system was installed about one year ago, and the 3Com phones are no longer in use. The district may still have these assets on site and plan to surplus them soon. The district will have an inventory audit in the near future and may reconcile these items then.

The IT Department was unable to produce a technology replacement plan. These plans consider the anticipated life span and replacement costs of network infrastructure components such as routers, switches, servers, storage, firewalls, web filtering appliances, etc. They then divide these costs into annual anticipated expenses to keep the overall network up to date and reliable. Without a technology replacement plan, expenses can be unanticipated and difficult to budget and fund.

## Recommendations

*The district should:*

1. Surplus the old phone system equipment from the fixed asset inventory.
2. Develop a network technology replacement plan that includes anticipated life span and replacement costs of core networking components.

## Web Site and Social Media Policies

The Metropolitan Education District website is the primary means for communication and outreach to the community and students. As an alternative educational option for high school and adult students in Santa Clara County, the district relies heavily on the Silicon Valley Career Technical Education and Silicon Valley Adult Education websites to advertise offerings, attract prospective students and increase enrollment.

The webmaster/database analyst has developed much of the content and structure of the district websites and intranets and is responsible for maintaining them. On the district website, the webmaster/database analyst updates news, posts documents, plans, maps and school board agendas and minutes, and on the adult education site, the webmaster/database analyst updates the class schedule links, class and testing center information.

In 2015, the adult education administration contracted with an outside consultant for a website redesign, which was developed with WordPress. The webmaster/database analyst is in the process of transferring adult education information to the WordPress templates. For both the district and adult education, the webmaster/database analyst meets weekly with the senior executive assistant to the superintendent to keep the information up to date.

On the technical education center website, the webmaster/database analyst posts news, class flyers and videos, and works with the center's assistant principal to update information. The webmaster/database analyst developed the online registration and wait-list system to meet the specific requirements of the technical education center counselors.

The district intranet includes internal forms, documents, employee phone lists and policies. The webmaster developed and maintains the intranet.

Staff reported that the websites are sometimes out of date. Although having a single webmaster ensures content control and standard formatting, it may also contribute to the outdated content and slow response to change requests. Users submit TSRs to request changes to the websites, and some staff contact the webmaster/database analyst directly for more prompt service. Because the webmaster/database analyst is the content manager and HTML programmer, no one else can do the work.

Keeping website information up to date is critical but difficult to achieve while relying on one staff person for the task. Therefore, many districts have adopted content management systems (CMS) to facilitate website development, enable teacher and department web pages, and ensure timely information. The advantage of a CMS is its ease of use and ability to distribute workload, but successful use requires planning, training and an approval process for posting content. In these cases, a webmaster maintains oversight of content, assigns user rights for editing, and ensures the web pages have a consistent appearance by designing and managing templates. By adopting a content management system, distribution of the workload helps ensure up-to-date information, back up support when the webmaster is unavailable, and promotes collaboration among those affected in the district. It also ensures sustainability by moving away from custom programming and by having the opportunity to use the CMS vendor for training and support when needed.

Websites and social media have become the primary means of communication for school districts, and communications directors are often key employees. Communications directors serve as community liaison and public relations managers and oversee website management, social media, ensure up to date content and well designed, easy to navigate websites. In some districts the web master fulfills the role of a communications director. The district's board policies 1113 for district and school websites and 1114 for district-sponsored social media provide a framework for school and teacher web pages and using social media.



## Recommendations

*The district should:*

1. Form a group of those affected to develop a comprehensive communication plan for the district, with a focus on the websites. This should include an assessment of the websites, the role of social media, current functionality, goal-setting, and development of an action plan.
2. Evaluate content management systems to determine their feasibility.
3. Cross-train staff to provide backup when the webmaster/database analyst is unavailable.
4. Establish consistent methods for website updates to improve timeliness of the information.

## Application Software

### District Level

At the Metropolitan Education District, the following applications are frequently used for operations and admissions:

- Exchange/Outlook      Productivity/communications
- Microsoft Office      Productivity
- QSS      Financial/business system

District staff use Exchange for district email and Microsoft Office for day-to-day productivity. The applications are installed on each of their computers, and files are stored on the local hard drive. If the computer hard drive failed, files would have to be recovered from that drive, and no backup copy may exist on a server or online. Staff are assigned to a single computer and cannot access their files from other locations.

Many districts have shifted from a single user per computer to a network design that allows staff to log in and access their files and applications from any computer on-site or off-site. Staff files are typically mapped to a network drive with automatic backup. When this is unfeasible, most districts offer either a secure online location or in-house server-based storage through a secure web portal. This allows staff to take advantage of mobile devices and have access to their work from any location.

Quintessential School Systems (QSS) is the district's integrated financial/business software and is provided through the Santa Clara County Office of Education. It includes accounts payable, accounts receivable, benefits, budget, human resources, payroll, position control, and state and federal reporting modules. Staff stated that QSS is not user friendly, and running reports on the system is difficult. They also indicated the county office had provided training in the past, but the version was upgraded in 2015, and the training has not been as thorough as in prior years.

QSS has a large network of users in districts and county offices throughout California. The company offers training webinars throughout the year and an annual user conference. Many districts participate in these opportunities because of the system's critical role.

### Silicon Valley Career Technical Education

At Silicon Valley Career Technical Education, administrative software applications include the following:

- Schoolhouse/AIM                      Student Information System
- Jupiter Gradebook                      Gradebook
- Teacher Reach/Blackboard              Auto messaging for attendance, emergencies and outreach

Silicon Valley Career Technical Education teachers use Jupiter software for grading, and the webmaster/data systems analyst imports the data into the student information system for reporting and transcripts. Jupiter is also used for attendance tracking. Staff stated the current student information system is not working well and technical education administrators cannot run reports themselves. All report requests are submitted to the systems support specialist/district registrar.

The district recently acquired Blackboard as its automated attendance calling and outreach system. Attendance is taken in the classroom using Jupiter, data is extracted twice per day and loaded into Blackboard to make calls. Staff indicated that the Blackboard implementation timeline had been delayed six months, and there was no follow-up with staff once the system was functional. Some staff were not certain whether calls worked accurately. The webmaster/database systems analyst manages the data extracts and imports between Jupiter, Blackboard and AIM.

Silicon Valley Career Technical Education is in the process of selecting a new student information system. The director of curriculum and instruction is managing this process, but no documented project plan was available to reference about this initiative.

Successful implementations of new student information systems are thoroughly planned, documented and managed and include significant time commitments by staff. They typically require a dedicated project manager who is either an employee with project management experience and authority, or a vendor representative who acts as project manager. In either case, the project manager must be able to form a project team with key employees, meet with them regularly, monitor the system installation, manage data migration, testing and quality assurance, develop training programs, meet project milestones and deliverables, and communicate to those affected.

Technical education teachers have selected a variety of software suitable for their curriculum. The technical education staff have individually selected online resources to achieve the instructional goals for their courses. The result is a varied set of social media and online methods for file storage.

Teachers depend on IT Department staff to install software on classroom devices. Staff reported delays in software upgrades and installations. Silicon Valley Career Technical Education has one laptop cart, and the rest of the classroom computers are desktops. Staff uses Microsoft Office applications and Exchange email. For technical education curriculum and instruction, applications and hardware mentioned during interviews were as follows:

- Google Drive and Docs
- Adobe Creative Cloud Media classes
- Blogger Collaboration for students
- Socrative Online learning and assessment
- Drop Box Online storage & file sharing
- Cahoot Learning Online professional development
- Digital X-Ray Dental assistant course support
- Go Pro Photo/video capture and editing
- Apple TV T V O/S

As the curriculum increasingly includes technology, the demand for high-capacity, high-performing network services has increased. Technical education staff report that the network environment on campus has not kept up with the demand. Technical administrators and staff indicated they want to offer more technology classes and career pathways, but they are not confident that the campus network or IT staff would support these.

All students in Silicon Valley Career Technical Education take courses at one of four high schools in Santa Clara County, and they are enrolled at technical education for half days. For these students, access to electronic portfolios of their work demonstrating mastery and skills could support their college or career choices and enhance their opportunities after high school.

The district has not provided a standard method or adequate space for storing student work. Students cannot access files off-site unless they have their own methods such as a flash drive, or an instructor has provided alternate locations for online storage. In some classes, file storage requirements are high, up to 50GB per year per student. These requirements and lack of capacity in the district have resulted in the instructor contracting separately for cloud storage. Other teachers use Drop Box for file sharing and storage. In other classes, student files are stored on the local computer “c: drive”, and students who need access to their files from other computers must use a portable USB flash drive for file storage.

Many districts offer either a secure online location or in-house server-based storage for students with a secure web portal. This allows the students to take advantage of mobile devices and have access to their work from any location.

Many districts are adopting online learning management systems. In addition to secure file storage, these systems provide opportunities for students to collaborate, retrieve materials, submit work, track progress, receive teacher feedback, and participate in class discussions. Some integrate Google docs to make use of the free features of that system. For Silicon Valley Career Technical Education, these types of systems would facilitate learning and communication beyond the classroom.

### Silicon Valley Adult Education

At Silicon Valley Adult Education, operations and administrative software applications include the following:

- ASAP                                      Online registration, class management, reporting
- Word Press                              Website

Curriculum and instruction software include the following:

- Burlington English                  ESL curriculum
- Plato/Edmentum                      Standards-based online courses
- Khan Academy                         Online instructional videos

Adult education implemented the ASAP student information system in July 2015. Users report the functionality is adequate, but does not entirely meet their expectations. Training was provided during the initial rollout, and the systems support specialist/district registrar now supports users.

At Silicon Valley Adult Education, software is installed on each computer in the labs. Some adult classes use Plato, and Burlington English for ESL. Both systems use a combination of online modules and classroom lessons.

### Both Schools

Many staff members have unofficially adopted Google Applications for Education (GAFE) as a productivity platform. The IT Department has not set up a GAFE domain, which would help staff and students in using this free educational document system. Having a GAFE domain would allow students and staff to securely log in, create and share documents, and communicate via email.

Interviews indicated that the district heavily relies on Adobe Creative Suite and does not have licensing for the newest version. Many teachers and administrators are concerned about the heavy reliance on the product yet no clear plan was given as to how the new licensing would be purchased or distributed.

The district has a Microsoft CAMSA agreement with a license that allows for the use of all Microsoft office products and the ability for students and staff to download and use Office at home for little or no cost. The district has not informed staff or students they can download and use these software products.

### Recommendations

*The district should:*

1. Establish regular meetings that include the director of information technology, curriculum leaders and administrators at both schools and the district to ensure systems operate properly for students and staff, align plans and priorities, and prepare for upcoming initiatives or changes in instructional needs for technology.

2. Develop a technology plan in collaboration with Silicon Valley Career Technical Education teachers and administrators to support new curriculum and mobile technologies. Identify systems that will support access to digital resources and secure online file storage for students and staff.
3. Develop a technology plan in collaboration with Silicon Valley Adult Education staff to support the unique needs of adult students.
4. Develop a district technology plan that includes both units and outlines specific goals and resource needs for the district.
5. Install high capacity wireless access throughout campus.
6. Designate a project manager for the new Silicon Valley Career Technical Education SIS implementation.
7. Develop an ongoing training plan for staff users.
8. Provide QSS training and participate in vendor user groups and conferences.
9. Implement a Google Applications for Education domain.
10. Complete the technology plan that includes expanded storage and backup capacity.
11. Evaluate the renewal of licensing of the new Adobe Creative Cloud. CETPA has a purchasing agreement with Adobe that should be considered.
12. Evaluate how to best use the district's Microsoft CETPA and Microsoft Strategic Alliance (CAMSA) agreement to reduce costs and increase availability of Microsoft products.

## Web Content Filtering

During the FCMAT visit, the team conducted several tests in several different areas of the campus to determine whether web content filtering is conducted within generally accepted school guidelines. The following areas were selected at random, tested and found to *lack any* kind of filtering: the computer lab in room 16, fashion design room 101, career center room 815, testing center room 10, and the administration offices. The team used available computers and their internet browsers in these rooms and easily accessed inappropriate material. The team was also told that almost all staff computers are not filtered at all. The only tested room that was filtered was room 709, internet engineering.

During interviews, staff indicated that filtering had caused problems with some online testing and other software packages, so it was turned off in these areas. The district uses a Fortinet content filtering appliance that can be programmed to allow a “white list” of testing sites or other educational sites, which should alleviate any problems with computers used for testing or other purposes. A white list includes sites that should not be blocked by the filter.

While the district has adult education classes that may not require web filtering on campus, these adult students are only about 20% of the entire student population. There is no reason why all computers for students and staff should not be filtered to some minimum level defined by the district. With proper network configurations and user authentication, a method of overriding the filter, which would be logged, could be granted to staff that require it.

## Recommendations

*The district should:*

1. Review the web filtering policy and at a minimum, set filtering levels as defined by the district.
2. Configure the network and user authentication to allow the setup of a web filter password override system for staff that may occasionally need unfiltered access to the internet.
3. Evaluate the inconsistency of the filtering policy even though not all student areas were tested.

## Network Infrastructure

A review of the existing network found that several areas were deficient in either technical configuration or the equipment and could not handle the demands of the increased need for Internet speed or data storage. The following areas were reviewed and should be considered areas for improvement.

*Note: some items in this area may be incomplete because the director of IT was not interviewed.*

### Network Switches and Fiber Cabling

Approximately one year ago, the district installed a new ShoreTel VoIP (voice over internet protocol) phone system. This new system is popular and has an easy interface for programming. Although the current VoIP install is running well, staff were concerned about the lack of phones in all classrooms and student learning areas. While the initial installation went well, not all rooms/areas were covered. All areas of the school should have a VoIP phone for communication and emergency calls. A power-over-Ethernet (POE) system would allow cameras, phones, and wireless access points to run seamlessly in the network, without the cost of adding more hardware. This is accomplished by adding a small amount of current to the Ethernet port, providing power to devices attached to a POE port.

With the advent of VoIP phones, IP cameras, wireless access points and other POE-based network devices, the district should have upgraded all edge switching to POE. Now, it would have to install POE injectors and mid-span ports to accommodate POE network devices. Mid-span is a power injector unit that adds cost to network when POE switches are not used.

Many years ago, the district installed multimode fiber from the server room to each main building. The current standard for running 10 Gig Ethernet on this type of fiber optic is 25 meters or approximately 75 feet. The old fiber cannot handle the faster transmission speeds needed today. (Reference [https://en.wikipedia.org/wiki/10\\_Gigabit\\_Ethernet](https://en.wikipedia.org/wiki/10_Gigabit_Ethernet)). The distance from the server room to the 100 Building is approximately 1,500 feet. It may be necessary to replace the current (old style) multimode fiber with newer single-mode fiber capable of transporting 10, 40 or 100 Gig Ethernet speeds. A 10 or 40 Gig backbone of Ethernet will be necessary to meet the district's future technology needs.

Keeping up with technology is difficult but necessary. The best districts plan each year for infrastructure upgrades to avoid falling behind in technology, maintain network reliability, and spread the expense out over time. Spending \$20,000 to \$30,000 a year on technology is easier to budget than trying to allocate and spend \$100,000 to \$200,000 in one year. 10/100/1000 POE switching with 10 Gig fiber optic backbones are the standard network configuration today.

### Recommendations

*The district should:*

1. Conduct a districtwide network review to determine a replacement/upgrade course of action for POE switches.
2. Evaluate the replacement of the district fiber backbone to support 10 Gig or 40 Gig network speeds.
3. Place a phone in every lab, classroom, or student learning area.

## Assignment of IP Addresses to Networked Devices

The district assigns static IP addresses to all wired computers. This is a time-consuming and unnecessary process. The stated reason for this change was a security issue, but no real security is realized with static assignment, and a significant amount of time is necessary to manually track these static IP address via spreadsheets. The added requirement that the lead network specialist assign and track an IP address to a desktop unit before a technician can install it causes a slowdown. The district can use dynamic host configuration protocol (DHCP) to assign IP addresses for desktop and other IP-based equipment. DHCP is an automatic way of assigning an IP address to a PC or other network devices. A server keeps track of each network device as it connects and leaves the network, automatically assigning and unassigning IP addresses.

DHCP is a cornerstone of modern networks, makes implementation easier and management of devices simple. Setting up DHCP scopes for each VLAN and setting scope options helps ensure network IP addresses are assigned properly without manual intervention.

## Recommendation

*The district should:*

1. Implement DHCP and discontinue the practice of assigning static IPs to the desktop.

## Email

The district uses Microsoft Exchange for email services. Staff use Outlook to access email on PCs in the network, while access to email outside the network is accomplished with Outlook Web Access.

The district has two exchange servers set up in a tandem configuration in a VMware environment with a front-end load balancer. If one exchange server malfunctions, the other takes over and continues email services. A district the size of Metro Education does not need a tandem Exchange server environment. First, both Exchange servers are hosted in the same VMware environment using the same piece of hardware, server room, commercial power supply and backup. Any fail-over redundancy is lost with both servers in the same room. Second, the complexity of an added load balancer along with necessary logging to move messages between servers adds a layer of complexity that is unnecessary for a district of less than 150 email accounts.

Exchange can be a complex system to run and maintain, but it can also be easy to operate if setup properly. One Exchange server can usually handle several thousand emails accounts. Exchange is a robust and proven product, but one server is enough for most districts of this size.

## Recommendation

*The district should:*

1. Evaluate the possibility of removing the load balancer and one exchange server, making the entire email system much easier to operate and less costly to maintain.



## VMware Servers and Storage

The district uses VMware as its virtualization platform. VMware is a popular platform for server virtualization. Three physical host servers house 11 virtual servers. At least 10 older physical servers could be virtualized in to the current VMware environment. This would save on expenses related to uninterruptible power supplies (UPS), cooling and upkeep. The usable space in the VMware environment is approximately 2 TB. This space resides in a storage area network (SAN) unit, which is connected to the VMware servers. The SAN unit is a HP EVA 4400.

During interviews, staff frequently indicated the SAN does not have enough data storage space to hold pertinent data for users such as board packets, data for the video class or other student projects.

## Recommendations

*The district should:*

1. Evaluate the possibility of adding additional data storage to the existing VMware attached SAN, or replacing it with a new platform that can handle the requirements of the video class, students and staff.
2. Consider decommissioning the old physical servers if the district decides to add additional SAN storage, which would allow for more virtual servers to be added to the existing VMware environment.

## Wireless Network

The district uses Ruckus products for its first wireless network. This was installed approximately two years ago, and the district has experienced problems with the wireless system. In many interviews, staff complained about being removed from the network and slows speeds.

FCMAT conducted a brief test of the wireless network and connected to the guest SSID. The test measured only 2.3 Mbps of download speed after school was out. IT staff reported that the wireless access points were turned down to a maximum of 3.0 Mbps to conserve bandwidth. One of the reasons that the wireless network cannot support district needs is the slow connection speed at which the wireless access point connects to the switch.

Most of the switches are old 10/100 Mbps devices with a 1gigabyte uplink to the core switch/router. Today's wireless access points need a 1 or 2 Gbps connection via a POE switch port connected to a robust network backbone of 10 Gbps or greater to carry data.

## Recommendations

*The district should:*

1. Connect all wireless access points to a 1 Gbps switch port and avoid placing restrictions on the speed of the wireless connection.
2. Examine the fiber optic backbone to assess its capabilities for running a high-speed backbone of 10 Gbps or greater.



# Disaster Recovery

## Backups

The district uses two backup methods. The first and primary one is a Barracuda system backup with limited local data storage on a 1U sized appliance combined with cloud storage at an off-site Barracuda location. The second is a manual backup of selected systems performed by the webmaster/database analyst using tapes or a disk, which is then taken off site. Barracuda backups are performed, but a full data backup has not been completed since the system was first installed; only differentials were used since then.

Differentials backups are the only files that change every day. As an example, if 100 files change on Monday, only those 100 files are backed up. After many months of this process, every backup from the last full one would be necessary to restore the server. Restoring that many backups is extremely difficult and time-consuming.

Data is backed up, but server operating systems and server configurations are not, which greatly increases restore time. This was a common method years ago, but the down time that would result before data could be restored to any of the servers would be significant. No testing has been done of fully recovering servers and the associated data. Not doing full backups at least every 30 days and depending instead on differentials for full recovery (known as synthetics full) is an unsound practice.

## Recommendations

*The district should:*

1. Review the backup process for all servers and all district data.
2. Load a full VMware server from backup and test the recovery and soundness of the backup strategy every few months.
3. Backup all servers and all data to online on-site storage in a different building on campus. Test one full server backup every month.

## Recovery

The district does not have a comprehensive disaster recovery plan to protect all data and critical systems and does not perform manual data recovery and restore tests to ensure critical systems and data can be retrieved in a timely manner to protect operational continuity in case of an emergency. During interviews, technical support staff indicated they were uncertain what they would do if the server room were destroyed in a disaster.

Every district regardless of size should have a disaster recovery plan. Since IT services have become an essential part of school business and teaching, a major problem can arise if the network, connectivity to the Internet, or applications servers are unavailable. School districts increasingly depend on stable, fast, and recoverable IT systems. Therefore, it is critical to ensure that certain critical data systems can be recovered and brought back online within an acceptable amount of time to all parties involved. As with all disaster recovery plans, the faster the need to have data made available, the more the cost to implement that plan.

Two major functions are most essential for school business operation. The financial system supporting payroll, accounts payable, accounts receivable, the general ledger and assets. The second is the student information system with student grades, attendance and supporting health and safety data. At a minimum, these two systems should have a quick-recovery plan.

VMware has excellent disaster recovery capabilities when paired with an online disk backup system that can mount backups directly to VMware from backup sets. This means that a server backup can be started directly from the backup copy without having to first set up new hardware and restore files. This saves a significant amount of time after a server has crashed. Recovery can be accomplished in hours instead of days.

The best practice is to have an online disk in another building on campus, with offline backup in the cloud for disaster recovery. Additional information on disaster recovery and best practices can be found at <http://searchdisasterrecovery.techtarget.com/Data-center-disaster-recovery-plan-template-and-guide>.

## Recommendations

*The district should:*

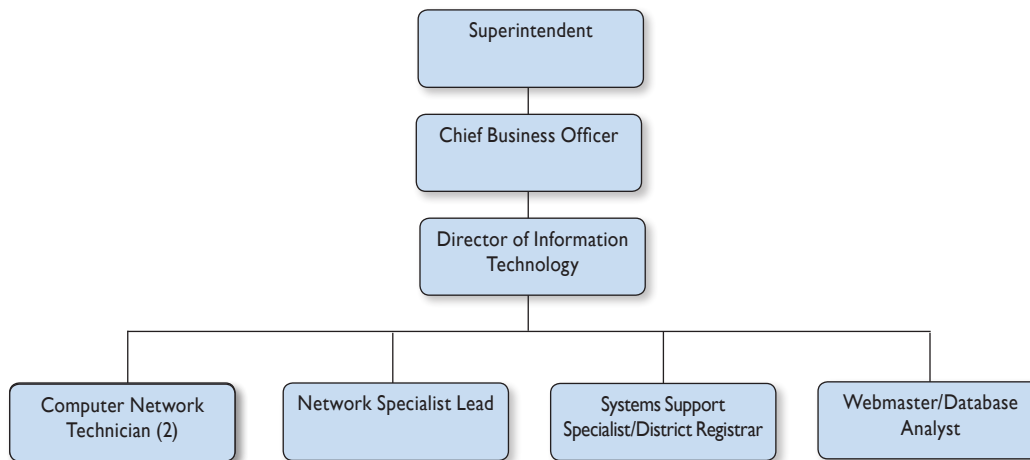
1. Develop a disaster recovery plan that at a minimum covers SIS and financial data backup and recovery.
2. Schedule and conduct regular manual tests on all components of the disaster recovery plan to ensure business continuity in case of a disaster.
3. Identify an off-site disaster recovery location that is outside district boundaries and is unlikely to be affected by the same disaster as the organization's primary site. The district should evaluate a cloud-based disaster recovery service that has multiple locations with high-speed connections for dedicated, geographically redundant cloud-based disaster recovery that provides data protection with a guaranteed uptime service-level agreement.

## Technology Support Staffing and Organization

The district IT Department serves programs of Silicon Valley Career Technical Education and Silicon Valley Adult Education and is led by a director of information technology who reports to the chief business officer. The department consists of a network specialist lead, systems support specialist/district registrar, webmaster/database analyst, and two computer support technicians, one of whom is a temporary employee. All IT staff report to the director and are full-time, 12-month employees.

The IT Department staff are experienced and have worked in the district 10 to 27 years with the exception of one temporary computer support technician who began in 2015. Staff reported that they have one or two department meetings per month, and the network specialist lead meets with the director weekly.

The director of information technology is the leader of the department and reports to the chief business officer. The department is organized under the director of information technology as depicted in the following organizational chart.



The following information, analysis and recommendations for positions are designed to help the district optimize the delivery of technology support services.

### Director of Information Technology

*The director of IT was not available for interviews with FCMAT either on the phone or in person, and did not provide the team with a list of job duties.*

The job description states, the “Director of Information Technology serves as the District Chief Technology Officer.” Duties described include working with the cabinet to plan and design systems necessary to meet instructional and operational needs, directing and developing integrated information systems, coordinating IT Department activities to ensure adequate support for district needs, developing short- and long-term goals for the department, and providing leadership to the organization on issues related to information and communication systems.

Various staff indicated a lack of technology leadership in the district. They reported instances of lack of support by IT for new initiatives and changing classroom needs, unreliable and insufficient wireless access, an overall lack of coordination and communication with teachers and

administrators, cumbersome and inefficient information and network systems and the lack of a technology plan.

The job description states the director of IT reports to the superintendent. Although the position reported to the superintendent in the past, the incumbent reports to the chief business officer.

Well-functioning technology departments have strong leaders who direct technology planning, have knowledge of networking and infrastructure, technology support, policies, hardware and software, data systems, and the educational environment. They typically report to the superintendent, and participate in the superintendent's cabinet. They collaborate with district staff and use advanced network design and network management systems to provide efficient, cost-effective, responsive systems and support and align IT Department activities with the district's educational goals.

## Recommendations

*The district should:*

1. Ensure that the director of information technology position is a hands-on, working position assisting IT departmental positions with their workloads.
2. Assign the director of information technology to report to the superintendent.

## Network Specialist Lead

The IT Department has one network specialist lead.

The job description describes a wide range of responsibilities related to administering the district's wide area network (WAN) and local area network (LAN), related services and user support, including telecommunications, servers, email, printing, systems security and storage. Job duties include technical support for all end-user computer-related issues, planning and implementing technical solutions to network issues, network monitoring, and installing and maintaining network hardware and software systems.

The network specialist lead job description also includes participation in planning and working with school technology teams and attendance at "workshops, conferences and technical seminars to maintain and update technical knowledge." In the case of the new Apple OS management tool, the network specialist training did not occur until several months after the delivery of the Apple computers. As a result, they had not been put into use as of January 2016, which was far later than the expected timeline for classroom use of August 2015. The reasons for the training delay were not clear during staff interviews, but the impact was significant for students and teachers. Ongoing planning and collaboration between the network specialist lead and teachers and school administrators would have helped communicate problems and timelines.

The broad scope of this job description is difficult for one person to accomplish in the current network environment. However, the workload should be manageable once the network is modified as recommended elsewhere in this report.

A network specialist lead should play a primary role in responding to staff requests for more access to files, mobile technology, cloud services and social media tools. Cohesive, collaborative planning with staff of Silicon Valley Career Technical Education and Silicon Valley Adult Education staff would contribute to more updated network environment and services to support district educational programs.

## Recommendations

*The district should:*

1. Ensure the scope and workload for this position are reasonable once the network modifications recommended in this report are implemented.
2. Ensure that mobile device management responsibilities handled by the webmaster/database systems analyst are redistributed to this position, and the computer network support technicians.
3. Ensure director and network specialist leads participate in school and district planning to enable closer alignment between the education programs and IT.

## Systems Support Specialist/District Registrar

The IT Department has one systems support specialist/district registrar. The job description states that the systems support specialist/district registrar “provides a variety of technical, data management and auditing duties relating to the District’s student attendance system and information systems support.” This individual manages the student information systems for Silicon Valley Career Technical Education and Silicon Valley Adult Education, is the main point of contact for the SIS vendors, audits attendance, produces required state reports, and provides support and training for users. As the district registrar, this individual generates student transcripts, manages and archives student records, and attendance audits. This individual also works closely with the webmaster/database analyst to prepare reports, ensure data is transported accurately and as frequently as necessary between systems, and responds to requests for custom reports from district administration.

Additional duties performed include serving on the technology committees of both schools, and acting as the IT office manager by handling department requisitions and purchases, and employee absence reports.

Because the two schools have separate reporting requirements and structures they have separate data systems for student information, each of which requires different training and support. This adds complexity to the systems support specialist/ district registrar position. The conversion from the old student information systems, AIM, to the new one, ASAP, occurred in Silicon Valley Adult Education in July. Once the data transfer and vendor training were completed, ongoing user training and support has been taken on by the systems support specialist/district registrar. When a new student information system is identified for Silicon Valley Career Technical Education, the implementation and transfer from the legacy system, AIM, will require significant time and user training, which will also be the responsibility of this position.

The district has no identified project manager for the ASAP implementation, and it is unclear whether the selection process for the new Silicon Valley Career Technical Education system included input from data staff. In districts with high-demand, high-performing data systems, data managers play a key role in planning and informing the selection process for upgrades or

new systems for which have responsibility. The position of project manager, either an internal employee or contracted through the vendor, is important for successful implementation of enterprise systems. This position develops project timelines, milestones, and training plans, manages the project team, and ensures on-time completion.

Staff comments indicate they know this staff member has a large workload and stressful job. This individual works outside the job description by also acting as an ad hoc IT Department office manager. Tasks such as attendance reporting, transcripts, and user support and training directly related to the student information systems are appropriate, but the added responsibilities of IT Department office manager and help desk should be handled by another position.

## Recommendations

*The district should:*

1. Identify a project manager to ensure successful implementation of the new ASAP SIS.
2. Reassign IT Department purchase requisitions and absence reports elsewhere in the organization to ensure compliance with the systems support specialist/district registrar job description.

## Webmaster/Database Systems Analyst

The IT Department has one webmaster/database systems analyst. The job description states that this position “performs programming and computer server tasks for the District’s web-based and database servers; identifies and resolves web related services for all District’s databases”, and is “responsible for developing and implementing technical aspects of web page solutions...”. The job description describes the following duties:

- Webserver - Designs, develops and maintains web services and databases for the District’s internet and intranet web servers; provides browser readable screens and reports as required; performs regular backups and archiving of data relating to web services and periodic recovery validations
- Designs, develops, implements and maintains several independent databases for district web pages, and tools that display district policies, union contracts, procedures, forms, templates and other important documentation.
- Database Systems Analyst - Maintains student system databases; generates periodic reports as required; performs regular backups and archiving of data with periodic recovery to validate procedures; designs, creates, modifies database schemas, reports and a working knowledge of Informix data bases; fully understands database principles; uses Crystal Reports for student system; able to create appropriate student reports.

This position works closely with the senior executive assistant to the superintendent to keep the websites up to date, and develops custom programs for some systems and reports. Users request changes to the website by submitting requests through the technology service request system. The webmaster/database analyst retrieves requests directly from this system and replies to direct requests via phone or email from users.



The district uses ASAP (Silicon Valley Adult Education) and AIM (Silicon Valley Career Technical Education) student attendance systems and Jupiter Grade Book. The database systems analyst works with the systems support specialist/district registrar to support these, manages the district-developed wait list system used by Silicon Valley Adult Education counselors to assist with student scheduling, and is developing an online registration system for that school. Data synchronizations are required to support the eClass Manager for online courses and the ParentLink automated attendance-calling service.

The combination of webmaster and database systems analyst responsibilities in a single job contributes to a large workload for one individual. Each is time-consuming and demanding. Because of the critical nature of the systems managed by this individual, any absence from the district has a negative effect throughout the organization. The broad scope of this position makes it difficult to address each area effectively.

Most districts have adopted content-management systems to allow district schools and departments to manage their own content, reducing the need to rely on one individual for all edits and changes to the websites. The webmaster typically retains oversight for design, functionality and content approval.

In addition to the responsibilities included in the job description, this individual assists with email password resets, and is attending training to manage the newly acquired enterprise mobile device management system for Apple computers, which will assist with implementation and management of Apple computers in the network. Most districts assign responsibility for mobile device management to a network specialist and computer network technicians, and in many districts, help-desk staff handle password resets.

## Recommendations

*The district should:*

1. Adopt a web content management system.
2. Redistribute some of the webmaster/database systems analyst's device-management and technical duties to the network specialist and computer network technicians.

## Computer/Network Technicians

The IT Department has two computer/network technicians. One position is vacant, and the other is filled by a full-time temporary technician from Align Technical Resources, LLC through a district contract.

The computer/network technicians serve both the Silicon Valley Adult Education and Silicon Valley Career Technical Education campuses, and the work performed fits the job description. They are responsible for installing new computers, and have expertise in hardware and software troubleshooting and support, computer configuration, installation and repair, audio-visual equipment, Voice over IP (VoIP), printing, cabling and networks. They use "ghosting" technologies to configure and deploy PCs, and remote access for repairs whenever possible.

The job description includes the following duties:

- Monitor district's TSRs

- Identify computer system and/or network connectivity problems, complete as appropriate
- Perform preventative maintenance for software and hardware issues
- Resolve technical issues on end-user computers
- Perform disk drive optimizations, new computer installations, setups and file management procedures
- Perform diagnostics and repairs on computer problems (e.g., disk drive failures, memory parity errors, video problems, printer failures, network troubleshooting, etc.)
- Install software and hardware upgrades; configure changes to existing systems
- Create disk drive images using ghosting/cloning techniques
- Provide on-site district-wide technical support for all end-user computer related issues; includes printer connectivity issues relating to the district's student attendance client application, eClass Manager for student attendance software
- Set up projectors, laptops and sound system for scheduled board meetings and other presentation events
- Assist the Network Specialist in establishing and maintaining network interfaces
- Capable of selecting, installing and integrating complete software application operating systems utilizing cross-functional integrations
- Pull, install and test network CAT twisted pairs Ethernet cabling terminated to patch panels or RJ45 type connectors

Based on the complexity and variety of systems supported and the differing support needs of the two schools, two full-time computer support technicians are warranted.

Users indicated the IT Department technicians lack Apple operating system expertise. Thirty Apple computers delivered in August had not been delivered to the classrooms by mid-January. The configurations and installations were delayed pending the completion of training by the network specialist lead and webmaster/database systems analyst in the use of JAMF Apple management software.

Most districts allow a variety of devices for instruction and administration and have provided training or hired technicians who can support multiple operating systems and platforms. Computer network technicians in these environments acquire expertise by attending training and taking classes, including mobile device management systems.

## Recommendations

*The district should:*

1. Fill the vacant computer network technician position.
2. Train computer network technicians on Apple operating systems and the JAMF system and provide ongoing training opportunities to gain new skills and keep abreast of new technologies.
3. Assign device management responsibilities to the computer network technicians once training is completed.

# Appendix

## A: Study Agreement



## Appendix A: Study Agreement



CSIS California School Information Services

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### FISCAL CRISIS & MANAGEMENT ASSISTANCE TEAM STUDY AGREEMENT

October 8, 2015

The Fiscal Crisis and Management Assistance Team (FCMAT), hereinafter referred to as the team, and the Metropolitan Education District, hereinafter referred to as the district, mutually agree as follows:

#### 1. BASIS OF AGREEMENT

The team provides a variety of services to school districts and county offices of education upon request. The district has requested that the team assign professionals to study specific aspects of the district's operations. These professionals may include staff of the team, county offices of education, the California State Department of Education, school districts, or private contractors. All work shall be performed in accordance with the terms and conditions of this agreement.

In keeping with the provisions of Assembly Bill 1200, the county superintendent will be notified of this agreement between the district and FCMAT and will receive a copy of the final report. The final report will also be published on the FCMAT website.

#### 2. SCOPE OF THE WORK

##### A. Scope and Objectives of the Study

The scope and objectives of this study are to:

1. Conduct a comprehensive analysis of the district's state of technology including leadership, hardware, software, department staffing, and technology use. Interview principals, department directors and classified staff to gather data on the software applications and hardware utilized. Review and analyze the district's technology master plan with an emphasis on the integration with the Local Control Accountability Plan (LCAP).

2. Analyze the status of the following:
  - a. Project management
  - b. Infrastructure planning, deployment, and maintenance
  - c. Help desk system and ticketing process
  - d. Website development and support with an emphasis on content management, board and social media policies
  - e. Hardware installation and setup
  - f. Application software used at district and site levels, including, but not limited to, the Student Information System and Automated Attendance Dialer
3. Review the job descriptions, skill level, and staffing of the technology department, including any site-level support.
4. Review professional development methodology for technology department staff.
5. Review life-cycle management of devices including acquisition, disposal and inventory management.
6. Make staffing recommendations based on the support level necessary to meet the district's technology requirements.
7. Review the network design for systems and data safeguards against a catastrophic event or security breach.
8. Review the processes or planning used to ensure that hardware and software assets are up to date.

B. Services and Products to be Provided

1. Orientation Meeting - The team will conduct an orientation session at the district to brief district management and supervisory personnel on the team's procedures and the purpose and schedule of the study.
2. On-site Review - The team will conduct an on-site review at the district office and at school sites if necessary.
3. Exit Report - The team will hold an exit meeting at the conclusion of the on-site review to inform the district of significant findings and recommendations to that point.
4. Exit Letter – Approximately 10 days after the exit meeting, the team will issue an exit letter briefly summarizing significant findings and recommendations to date and memorializing the topics discussed in the exit meeting.
5. Draft Reports - Electronic copies of a preliminary draft report will be delivered to the district's administration for review and comment.
6. Final Report - Electronic copies of the final report will be delivered to the district's administration and to the county superintendent following completion of the review. Printed copies are available from FCMAT upon request.

7. Follow-Up Support – If requested, FCMAT will return to the district at no cost six months after completion of the study to assess the district’s progress in implementing the recommendations included in the report. Progress in implementing the recommendations will be documented to the district in a FCMAT management letter.

### 3. PROJECT PERSONNEL

The study team will be supervised by Michael H. Fine, Chief Administrative Officer, Fiscal Crisis and Management Assistance Team, Kern County Superintendent of Schools Office. The study team may also include:

- |                            |                                 |
|----------------------------|---------------------------------|
| <i>A. Scott Sexsmith</i>   | <i>FCMAT Management Analyst</i> |
| <i>B. To be determined</i> | <i>FCMAT Consultant</i>         |
| <i>C. To be determined</i> | <i>FCMAT Consultant</i>         |
| <i>D. To be determined</i> | <i>FCMAT Consultant</i>         |

Other equally qualified staff or consultants will be substituted in the event one of the above individuals is unable to participate in the study.

### 4. PROJECT COSTS

The cost for studies requested pursuant to E.C. 42127.8(d)(1) shall be as follows:

- A. \$500 per day for each staff member while on site, conducting fieldwork at other locations, preparing and presenting reports, or participating in meetings. The cost of independent FCMAT consultants will be billed at their actual daily rate.
- B. All out-of-pocket expenses, including travel, meals and lodging.
- C. The district will be invoiced at actual costs, with 50% of the estimated cost due following the completion of the on-site review and the remaining amount due upon the district’s acceptance of the final report.

**Based on the elements noted in section 2 A, the total estimated cost of the study will be \$17,500.**

- D. Any change to the scope will affect the estimate of total cost.

Payments for FCMAT’s services are payable to Kern County Superintendent of Schools - Administrative Agent.

## 5. RESPONSIBILITIES OF THE DISTRICT

- A. The district will provide office and conference room space during on-site reviews.
- B. The district will provide the following if requested:
  - 1. Policies, regulations and prior reports that address the study scope.
  - 2. Current or proposed organizational charts.
  - 3. Current and two prior years' audit reports.
  - 4. Any documents requested on a supplemental list. Documents requested on the supplemental list should be provided to FCMAT only in electronic format; if only hard copies are available, they should be scanned by the district and sent to FCMAT in electronic format.
  - 5. Documents should be provided in advance of field work; any delay in the receipt of the requested documents may affect the start date of the project. Upon approval of the signed study agreement, access will be provided to FCMAT's online SharePoint document repository, where the district will upload all requested documents.
- C. The district's administration will review a preliminary draft copy of the report resulting from the study. Any comments regarding the accuracy of the data presented in the report or the practicability of the recommendations will be reviewed with the team prior to completion of the final report.

Pursuant to EC 45125.1(c), representatives of FCMAT will have limited contact with pupils. The district shall take appropriate steps to comply with EC 45125.1(c).

## 6. PROJECT SCHEDULE

The following schedule outlines the planned completion dates for different phases of the study:

Orientation:	to be determined
Staff Interviews:	to be determined
Exit Meeting:	to be determined
Preliminary Report Submitted:	to be determined
Final Report Submitted:	to be determined
Board Presentation:	to be determined, if requested
Follow-Up Support:	if requested



7. **COMMENCEMENT, TERMINATION AND COMPLETION OF WORK:**

FCMAT will begin work as soon as it has assembled an available and appropriate study team consisting of FCMAT staff and independent consultants, taking into consideration other jobs FCMAT has previously undertaken and assignments from the state. The team will work expeditiously to complete its work and deliver its report, subject to the cooperation of the district and any other parties from whom, in the team's judgment, it must obtain information. Once the team has completed its fieldwork, it will proceed to prepare a preliminary draft report and a final report. Prior to completion of fieldwork, the district may terminate its request for service and will be responsible for all costs incurred by FCMAT to the date of termination under Section 4 (Project Costs). If the district does not provide written notice of termination prior to completion of fieldwork, the team will complete its work and deliver its report and the district will be responsible for the full costs. The district understands and agrees that FCMAT is a state agency and all FCMAT reports are published on the FCMAT website and made available to interested parties in state government. In the absence of extraordinary circumstances, FCMAT will not withhold preparation, publication and distribution of a report once fieldwork has been completed, and the district shall not request that it do so.

8. **INDEPENDENT CONTRACTOR:**

FCMAT is an independent contractor and is not an employee or engaged in any manner with the district. The manner in which FCMAT's services are rendered shall be within its sole control and discretion. FCMAT representatives are not authorized to speak for, represent, or obligate the district in any manner without prior express written authorization from an officer of the district.

9. **INSURANCE:**

During the term of this agreement, FCMAT shall maintain liability insurance in an amount not less than \$1 million unless otherwise agreed upon in writing by the district, automobile liability insurance in the amount required under California state law, and workers compensation as required under California state law. FCMAT shall provide certificates of insurance, with additional insured endorsements, indicating applicable insurance coverages prior to the commencement of work.

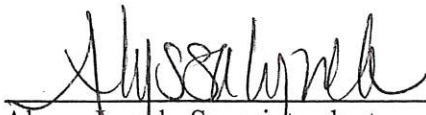
10. **HOLD HARMLESS:**

FCMAT shall hold the district, its board, officers, agents and employees harmless from all suits, claims and liabilities resulting from negligent acts or omissions of its board, officers, agents and employees undertaken under this agreement. Conversely, the district shall hold FCMAT, its board, officers, agents and employees harmless from all suits, claims and liabilities resulting from negligent acts or omissions of its board, officers, agents and employees undertaken under this agreement.

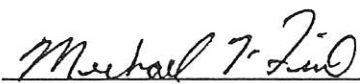
11. CONTACT PERSON

Name: Alyssa Lynch, Superintendent  
Telephone: (408) 723-6464  
E-mail: [alynch@metroed.net](mailto:alynch@metroed.net)



  
\_\_\_\_\_  
Alyssa Lynch, Superintendent  
Metropolitan Education District

Date 10/15/15

  
\_\_\_\_\_  
Michael H. Fine  
Chief Administrative Officer  
Fiscal Crisis and Management Assistance Team

Date October 8, 2015