January 8, 2018

Bill McCabe, Superintendent
Lassen Union High School District
1000 Main Street
Susanville, CA 96130

Dear Superintendent McCabe,

The purpose of this management letter is to present the findings and recommendations resulting from the Fiscal Crisis and Management Assistance Team's (FCMAT's) review of technology services at the Lassen Union High School District. As indicated in the study agreement, dated June 8, 2017, FCMAT performed the following:

1. Analyze the status of the following and make recommendations for improvement, if any:
    a. Technology leadership, planning, and project management
    b. Infrastructure replacement planning, budgeting, deployment, and maintenance
    c. Wireless deployment, management, configuration, accessibility, lifecycle management, and security
    d. Development of end-user device hardware standards
    e. End-user device acquisition and support
2. Review technology staff job descriptions, staffing levels and distribution of duties and responsibilities and make recommendations for improvement, if any.

FCMAT conducted fieldwork at the district on September 19-20, 2017, and additional off-site work during the weeks that followed. FCMAT reviewed numerous documents including board policies, equipment inventories and job descriptions.

Job Descriptions and Staffing Levels

The district's Information Technology (IT) Department consists of one 1.0 full-time equivalent (FTE) network administrator and one 0.5 FTE technology and assessment technician. This level of staffing is not unusual in small school districts; however, the wide scope of work assigned to the small 1.5 FTE department is unusual. The network administrator's job duties include, but are not limited to, installing systems; FCC licensing for radios; training on all items; acting as liaison between staff; building and

designing systems; acting as database administrator; installing fiber-optics; grant writing; and numerous other duties described in the job duties list. Although many of the listed duties belong in IT, several, including FCC licensing, may fit better elsewhere in the district.

The job description for the network administrator position consists only of a list of job duties. A complete job description would also include numerous other elements and is needed.

The job description for the technology and assessment technician position is complete but needs to be reviewed and updated. For example, the job description starts out with knowledge and skills that are on a beginning level, yet by the end of the paragraph states that the applicant should know how to handle the "maintenance of LANs [local area networks] and WANs [wide area networks]" and "configure and upgrade operating systems." These latter skills are desirable but are out of place in a job description for a lower level technician. The job description needs to be consistent in the level of skills it describes.

The IT Department staffing is somewhat low, even for a small district. Having one individual performing all technical responsibilities places the district at risk in case of a network or other technical failure. The failure may occur when this individual is unable to come in to work or when they may be out for an extended period. The district's network administrator is the only employee who knows the user names and passwords for the majority of the network infrastructure. This could cause serious problems if a problem occurred with the network and the administrator was unavailable: it would be extremely difficult or impossible to retrieve this information and could cause a long delay in resolving technical issues.

It would benefit the district to consider creating a 1.0 FTE network I technician position to replace the technology and assessment technician position. This would help the district cover for and relieve the workload of the network administrator, increase the department to 2.0 FTE employees, and help with the transfer of knowledge about network systems from the network administrator to the network I technician. This would benefit the district by providing backup support of the network if the network administrator is unavailable and allowing more monitoring and support of the network infrastructure. This should help ensure that systems are up and running properly so technology can be more reliably integrated into classroom learning.

Recommendations

The district should:

1. Review, update and revise the job descriptions for the network administrator and the technology and assessment technician positions.
2. Review the network administrator's workload and duties, including FCC licensing, with the goal of reducing the scope of work performed.
3. Have the network administrator create a document that contains a list of systems and their associated administrative user names and passwords, and place this document in a district safe and ensure it is updated annually.
4. Evaluate the feasibility of creating a 1.0 FTE network I technician position to replace the 0.5 FTE technology and assessment technician position.

Technology Leadership, Planning and Project Management

The district's small IT Department is responsible for everything a larger IT department does but has fewer resources. The department has a five-year replacement plan for desktop computers, laptops, switches, servers and other technology devices. The department also has an expired and obsolete Enhancing Education Through Technology (EETT) plan, which is no longer useful and needs to be replaced with a smaller more concise technology plan. The department maintains a comprehensive list of projects, including both summer and ongoing projects.

The plan for the wired and fiber-optic network is very good; however, the department needs support and mentoring to help with planning for the wireless system. The department plans to install a second wireless controller from a different vendor than the first, and split the campus between two different wireless systems. The department has not considered the complications of a two-controller wireless system or the impact it may have on staff and students.

The district had a technology committee in the past; however, it ceased many years ago because of lack of attendance and a tendency to complain about poor technology and lack of funding rather than significant efforts to solve issues and improve technology. These factors led the IT Department to pull away from the technology committee.

Technology project management could be improved. Many decisions are being made without input from district administrators other than those in IT and without peer review. This occurs partly because the IT Department is small. In interviews, staff expressed concern about insufficient communication regarding projects. In particular, staff expressed a desire for more communication about projects that could adversely affect them. Several recent summer projects caused some staff members to lose data. In addition, when the IT Department upgraded desktop computers to the Windows 10 operating system, few staff knew about the upgrade over the summer and were surprised when they returned to find a new operating system for which they had no training.

Today's Common Core State Standards, state requirements and student assessments all depend on technology. To be successful, a technology department first needs a technology plan that addresses how technology will be used to support teachers and students in the classroom. In addition, it needs a plan that shows how the district will achieve its technology goals and fund technology. Having a plan can help keep a district focused on proven technology that should provide a solid return on investment.

It would benefit the district to have peers or another agency review its technology projects. This can shed new light on a project and give a different perspective on problems that may be encountered and how they can be resolved. The district is not alone in facing technology challenges and trying to solve them in an affordable manner. Many districts have teamed up with county offices of education or other school districts to leverage technology personnel and support.

Recommendations

The district should:

1. Develop a three-year technology plan that includes support for students and teachers in the classroom.
2. Ensure that it communicates to users clearly and in advance about technology projects that may affect them.

3. Reestablish its technology committee and meetings, with a focus on problem solving. Meetings should be held at a least once per quarter.

4. Encourage IT personnel to visit other school agencies that have successfully implemented wireless technology systems to see new ideas in wireless technology use.

5. Consider having qualified personnel from another district or from the county office help review technology projects.

Infrastructure Planning, Installation and Maintenance

The district has Hewlett-Packard (HP) Procurve switches with limited lifetime warranties. These switches are Power Over Ethernet (POE) capable and have 1-gigabyte backbone connections or better.

The district's intermediate distribution facility (IDF) and main distribution facility (MDF) are in good condition, are well maintained, and have air conditioning and security. Network maps are updated and complete. Firmware updates are applied to switches and other network devices annually and as needed at other times. All IDF and MDF rooms have backup power supplies, and the MDF room has remote monitoring for high temperatures. The network has been set up to use virtual local area networks (VLANs), with logical separation between the management, staff and student VLANs. The level of maintenance and support of the network infrastructure is consistent with other districts of similar size that are performing adequate technical support of their networks.

The district's accounting department performs IT budgeting annually by rolling over the IT budget from the previous year and adjusting for necessary changes and to address upcoming technology plans, and the IT Department has a set annual budget for technology infrastructure upgrades. FCMAT's review of the IT budget and activity revealed several items that should be reviewed:

1. Expenses for districtwide purchases and maintenance of copiers are coming out of the IT budget. This is unusual; copier costs are often budgeted out of a district-level account, with the costs of maintenance and overruns being charged back to the schools and departments.

2. The annual amount budgeted for printer maintenance is $17,800, which seems high for a small district. The district may want to closely review this budgeted amount.

Given the relatively small size of the district's network, network upgrades and planning are not an everyday task. Instead, planning for network modification is done as needed unless a major server or switch deployment is being planned.

Recommendation

The district should:

1. Review its IT budget and activity, including copier expenses and cost distribution and printer maintenance costs.

Wireless Design and Management

In interviews, staff stated consistently and in strong terms that the district's wireless system needs repair. Teachers and administrators alike were concerned about the lack of wireless reliability and support.

Teachers expressed frustration over the instructional time lost trying to connect or stay connected to the wireless network, and over the disruption to lessons caused by unreliable wireless performance. These frustrations were common, as were accounts of students being unable to log on or access information because of multiple security login requirements at the access point and at user authentication, and stringent filtering policies. Many instructional staff interviewed felt the content filtering was excessive and hampered learning. Delays in logging on and slow internet speeds were also noted, though the cause of the delays was not known. The combination of a lack of wireless bandwidth and complex login procedures has resulted in a wireless system that is largely unused.

The wireless system was first built approximately six years ago and designed only for a coverage model, in which the main purpose was to provide the entire campus with a limited number of wireless access points sufficient for a few mobile devices to connect. Now staff and students are trying to use the wireless system much more heavily than it was designed for. Sufficient wireless coverage for current use requires a higher density wireless system with many access points that will allow numerous mobile devices to connect simultaneously.

The IT Department has decided to install a new wireless vendor's product. This would split the campus in half, with one wireless vendor's product controlling one half of the campus and another vendor's product controlling the other half. Although this is technically possible, it is not advisable because it makes the system extremely difficult to use and manage. Wireless systems are usually best managed by one controller that logically determines all the mobile devices logged on and their location on the wireless network. This type of controller allows a user to traverse the entire wireless coverage area without signal interruption or flaw because the controller seamlessly moves their signal to the best access point for continuity of connection.

The exact needs and policies for wireless network functions and use may vary from district to district. Some districts allow students and staff to connect personal devices to the network; some provide open guest access; and others allow their network to be used only by devices purchased by the district.

Most districts that have a successful wireless system started with a network plan. Such a plan typically details how the network will be used, the number of devices the network will need to support over the next three to five years, and what the network will be used for. In successful districts, this usually starts with an instructional vision that guides wireless network design and deployment. Effective plans include both instructional and noninstructional use of the network, and are the result of collaboration that includes representatives from all departments that will use the wireless network as well as from the technology department.

Recommendations

The district should:

1. Stop the purchase of a second vendor's wireless system until a review of wireless technology can be completed.
2. Develop a plan for a wireless network that meets current needs, including the components needed to develop it.
3. Perform a review of its wireless system, including coverage and user authentication methods.

4. Review its internet filtering settings and adjust them as needed for a high school education environment. If filtering settings are not part of district board policies or administrative regulations, the district should consider updating them to include guidance on effective filtering policies.

User Devices

The district has no official, documented purchasing standard for IT equipment. All technology purchase requisitions go through the IT Department and are either approved or denied by the IT Department. Some interviewees expressed frustration that users are allowed to request purchases of new technology only to have the IT Department deny the request. All purchases go through a standard accounting and purchase order process, with authorized approvals.

User devices consist mainly of desktop computers, laptop computers, and an Apple desktop lab for graphics instruction. The Apple lab is a standalone lab consisting of Apple desktop units and an Apple server. The lab is supported by the teacher, and by an outside vendor when needed. The lab is connected to the wired network but for internet access only. It is well maintained and provides a state-of-the-art learning experience for students in graphic design.

Eight other computer labs consist of 32-35 Dell OptiPlex systems each, and five smaller labs of 10-18 units each also use Dell OptiPlex computers. These systems vary from three to six years old. FCMAT inspected two of the labs and found them orderly, with computers in good condition and able to boot up in an acceptable amount of time. All desktop computers have the Windows 10 operating system and Microsoft Office installed.

The four laptop carts are composed of refurbished laptops that are at least three years old. Several individuals interviewed reported that the teachers found the laptop carts unusable. Several technical issues have contributed to this conclusion, including the lack of reliable network connectivity, the greatly diminished battery capacity of these older laptops, and the difficulty of configuring and maintaining laptops in a school environment without the proper software to help do so.

The district has unofficially standardized on a good quality enterprise level of desktop computers and Apple desktops. This enterprise grade of equipment helps greatly with installation and support, because the consistency of internal parts within the model line allows technicians greater familiarity with both hardware and software troubleshooting. It would benefit the district to continue purchasing and using this enterprise level of desktop computers. It would also benefit the district to reconsider the choice to purchase refurbished laptops; if it chooses to continue using laptops, purchasing new laptops would be a better choice.

The district may wish to consider other devices for students that use browser-based applications to access content for learning. These devices have a fast boot time (usually three to four seconds) and may be easier for IT staff to maintain and manage. The cost of these devices is also relatively low, typically in the $275-340 range depending on memory and screen size.

Setting standards for the IT equipment to be purchased and used is vital to effective IT operations and management. It is important to select equipment that is known to work for a particular application and can be supported easily. Setting standards allows technicians who support the devices to be trained on a particular device and provide better support. It also allows a greater number of non-IT staff to be familiar with these devices. When examining the total cost of ownership of a device, it is important to include both the initial purchase and support costs.

Many IT departments have the final authorization on technology purchases, and many IT leaders review technology purchase requests before they become purchase orders. An IT department needs to be prepared to handle the work of reviewing technology purchase requests so users are not frustrated by delays in purchasing, including purchases of small items. Many IT departments create a list of standard and preapproved commonly purchased items. This list can include desktop computers, monitors, computer mice, keyboards, switches, access points, printers, LCD projectors, replacement bulbs, laptop computers, and many other items.

Recommendations

The district should:

1. Continue to use the same enterprise level of desktop computers, refurbished or new.
2. Cease purchasing refurbished laptops; purchase new laptops instead.
3. Continue to use Apple computers and equipment for specific applications such as the graphics lab.
4. Evaluate the feasibility of purchasing devices with browser-based applications for student use.
5. Create and distribute a list of technology standards and common equipment preapproved for purchase. Include desktop computers, laptop computers, Apple products, printers, switches, access points and other items, and update the list at least once a year. Ensure that the technology committee is involved in developing this list.
6. Consider using the technology committee to vet requests for new technology items not already on a standard list. The committee should consider cost, support and maintenance of the new items.

FCMAT appreciates the opportunity to serve the Lassen Union High School District and extends thanks to its staff for their cooperation and assistance during this review.

Sincerely,

Scott Sexsmith
Intervention Specialist