Technology Update 2019

Purpose: This report allows us to provide a comprehensive overview of technology deployment in the district, updates on current and upcoming projects, and clarity on how technology funds are spent and how staff and students benefit as a result.

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Instructional Technology Department Vision

Shakopee Instructional Technology Services
will support the district's educational goals
by providing high levels of reliability, service, and support.

Tech Levy Promises

One piece of documentation provided to voters prior to the Capital Projects (Technology) Levy in May 2015 was a timeline covering various goals for the use of the increased funding. In reviewing those goals, it should be noted that many have been met or are on track toward completion (we are in year 3 of the chart now). In fact, out of all of the goals listed the only one that we have had to push back to later in the timeline is the replacement of classroom multimedia systems (Smartboards and projectors). We currently have a committee of staff working on gathering feedback and information about classroom audio-visual systems, since any significant change in those systems would have a significant impact not just on the classroom, but on curriculum materials and lesson plans that utilize our existing systems.

Shakopee Public Schools
Proposed Initial Plan for Technology Levy Funding
If voters approve Question 2 on May 5, 2015

Technology has become a critical part of all learning environments, but it has to compete with other important needs for funding. If voters approve the technology levy request, it would provide a stable and dedicated source of annual funding to give students access to the technology they need to learn, teachers the technology they need to teach and staff the training they need to use technology effectively.

GOAL	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Network/ Infrastructure	Replace network switches on 6-year replacement cycle					
	Increase and update data storage and capacity			Monitor use; increase as demand dictates		
	Replace 6 year old Smartboards/Projectors with Interactive Projectors increasing teaching space				Projectors: 6-year replacement cycle	
	Wireless access; target dead zones in academic areas		Replace access points on a cycle to ensure capacity and speed			
		Update aging systems (e-mail, telephone, information system for HR/Finance)				
Devices for students & staff	Replace/Add Computers and devices in Elem. Schools (approx. 1510)	Replace/Add Computers and devices in Elem. Schools (approx. 645)	Replace/Add Computers and devices in Elem. Schools (approx. 2090)	Replace/Add Computers and devices in Elem. Schools (approx. 1275)	Replace/Add Computers and devices in Elem. Schools (approx. 1375)	Replace/Add computers and devices in Elem. Schools on cycle
	Replace/Add computers and devices in Sec. Schools (approx. 2500)	Replace/Add computers and devices in Sec. Schools (approx. 2215)	Replace/Add computers and devices in Sec. Schools (approx. 365)	Replace/Add computers and devices in Sec. Schools (approx. 910)	Replace/Add computers and devices in Sec. Schools (approx. 2620)	Replace/Add computers and devices in Sec. Schools on cycle
Technology Support	Add additional tech support staff to provide technology training and support		Continue to provide instructional and technical support across all buildings and programs			
Training	Provide teacher training that directly supports academic design and curriculum needs. Training will be on demand, just-in-time, and personalized for teachers to support them in high quality uses of technology.					

Tech Levy Promises Report Card

Here is another view of the levy goals and what progress has been made.

Key:

- Not started
- In progress – Started but is not yet complete.
- Completed – A stand-alone project or task that has been finished.
- On-going – A project or task with annual targets that are being met.

Goal/Item	Status	Notes
GOAL: Network/Infrastructure		
Replace network switches on 6-year replacement cycle.		pp. 20-21
Increase and update data storage and capacity.		pp. 20-21; spring 2019
Replace SmartBoards/Projectors with interactive projectors increasing teaching space.		pp. 23-24
Wireless access; target dead zones in academic areas (and replace on a regular cycle).		pp. 20-21
Update aging systems: e-mail.		Completed 2016
Update aging systems: telephone.		p. 23; summer 2019
Update aging systems: information system for HR/Finance.		Completed 2015
GOAL: Devices for students and staff		
Replace/Add computers devices in Elementary and Secondary schools (various amounts year over year).		pp. 14-17
GOAL: Technology support		
Add additional tech support staff to provide technology training and support.		pp. 9-10 *Staffing Chart*
GOAL: Training		
Provide teacher training that directly support academic design and curriculum needs. Training will be on-demand, just-in-time, and personalized for teachers to support them in high quality uses of technology.		pp. 11-12 *DLC staff*

Technology Finances

This section provides an overview of technology-related spending over a 5-year span. It includes the current year (Fiscal Year 2018-2019, or FY19), two years prior and anticipated expenditures two years into the future.

There are many ways to slice and dice financial data. The numbers here are intended to give a high-level overview of the major categories of spending. One detail to be clear on from the outset is the revenue category: any reference to the General Fund indicates that the revenue source is regular district funding, specifically allocated for technology expenses. Any reference to the Levy is funding derived from the voter-approved May 2015 Capital Projects Levy, for which funds became available for use in the 2016-2017 (FY17) school year.
The speedy pace at which the district has moved into a 1:1 deployment of devices for students resulted in significant lease commitments. Over time we expect our lease commitments to stabilize. That spending is reflected in the "Levy Devices and Cases" line item.
The staffing section later in this report notes the specific funding source for all technology staff.

TECHNOLOGY EXPENDITURES	FY17	FY18	FY19	FY20	FY21
Gen Fund Salaries & Benefits	$ 1,255,905	$ 1,215,476	$ 1,309,827	$ 1,349,305	$ 1,376,292
Gen Fund Services, Supplies, Software & Capital Expenses	$ 1,220,000	$ 1,220,000	$ 1,083,150	$ 1,120,000	$ 1,130,000
General Fund Subtotal	**$ 2,475,905**	**$ 2,435,476**	**$ 2,392,977**	**$ 2,469,305**	**$ 2,506,292**
Levy Salaries and Benefits	$ 628,940	$ 938,323	$ 938,538	$ 963,164	$ 992,059
Levy Devices and Cases	$ 1,326,987	$ 1,539,320	$ 1,512,305	$ 1,781,732	$ 1,778,662
Levy Services, Supplies, Software & Capital Expenses	$ 367,000	$ 308,900	$ 608,451	$ 626,000	$ 636,000
Levy Subtotal	**$ 2,322,927**	**$ 2,786,543**	**$ 3,059,294**	**$ 3,370,896**	**$ 3,406,721**
All Salaries and Benefits	$ 1,884,845	$ 2,153,799	$ 2,248,364	$ 2,312,470	$ 2,368,351
All Devices and Cases	$ 1,326,987	$ 1,539,320	$ 1,512,305	$ 1,781,732	$ 1,778,662
All Services, Supplies, Software & Capital Expenses	$ 1,587,000	$ 1,528,900	$ 1,691,601	$ 1,746,000	$ 1,766,000
(General Fund + Levy) TOTAL	**$ 4,798,832**	**$ 5,222,018**	**$ 5,452,270**	**$ 5,840,201**	**$ 5,913,013**

Chart showing overall expenditures (combined General and Levy budgets)

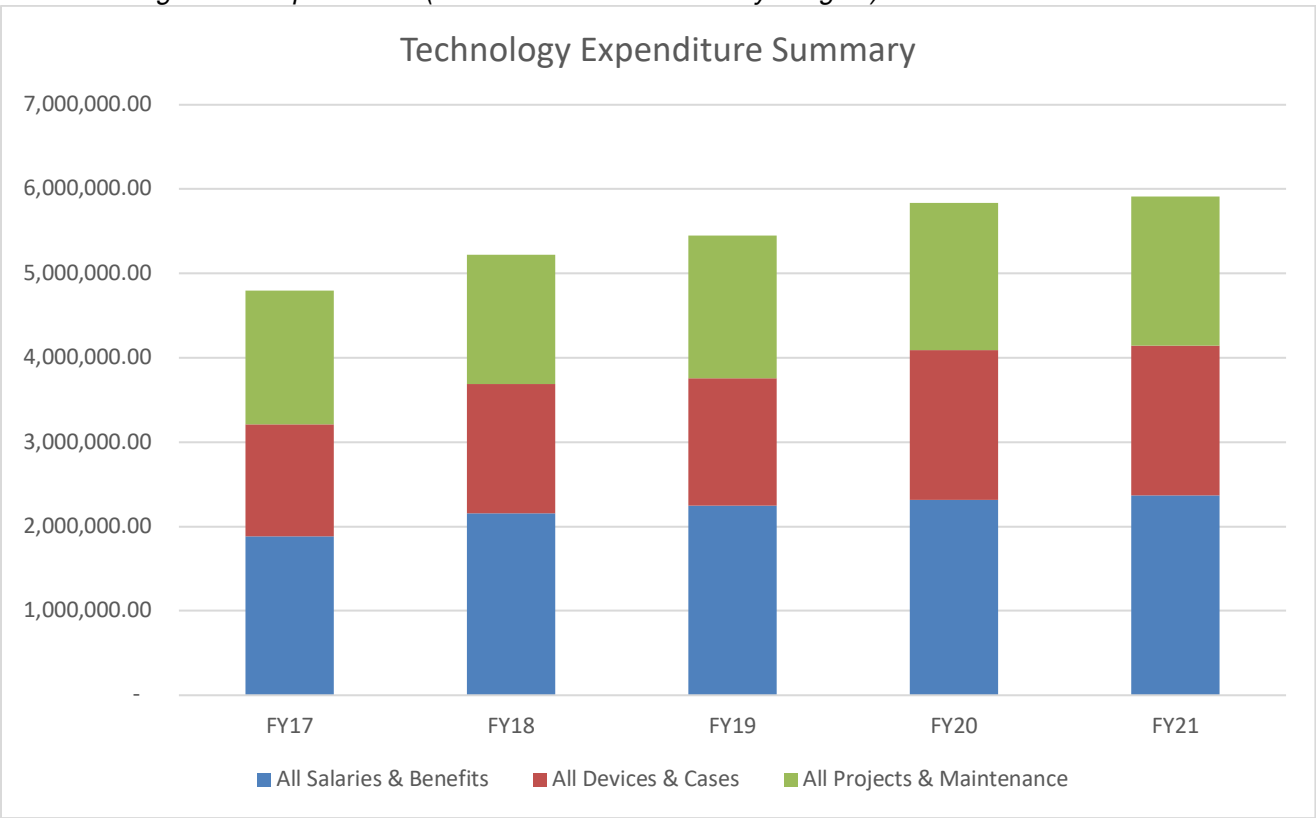
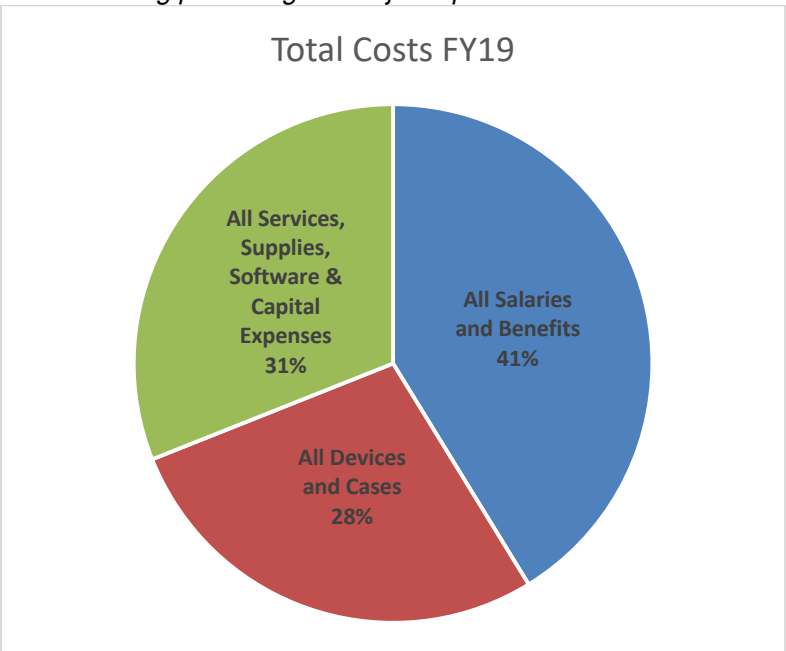


Chart showing percentage of major expenditures for 2018-2019



The primary categories of revenue for technology spending are the General Fund and the Capital Projects (Technology) Levy. The next chart provides a breakdown of revenue categories, where the funding originates, and the frequency or stability of each revenue stream.

Category	Source	Frequency
General Fund	State & Local	Annual
Capital Projects (Tech) Levy	Local	FY17-FY26 (10 years)
E-rate	Federal via a tax on phone service	Annual
Telecom Equity aid	State	Annual
Mi-Fi Grant	State	FY17-FY19
Surplus equipment sales	3rd Party/Commercial	Whenever surplus equipment is identified. (Deposits back to general fund)
Recycling	3rd Party/Commercial	Whenever recyclable items are identified. (Deposits back to general fund)

Revenue categories beyond the General Fund and Levy are not a significant contributor to the technology budget, but they are helpful. E-rate aid is diminishing as the federal government reduces the types of qualifying expenses, but still helps with costs related to our Internet service. Equity aid is a state allocation that also helps offset some of the Internet access costs. The Mi-Fi grant was a competitive grant awarded to the district last year, with a fixed amount of funds that has been expended at this point. Surplus equipment sales represent an area that we intend to pursue more aggressively and strategically as a counterpart to our device replacement cycle. Lastly, recycling of items such as unused wires and cables, bulk metal, and obsolete technology with no other resale value brings in the least amount of money but allows us to squeeze every last dollar out of unused (and unusable) items.

Capital Projects (Technology) Levy Background

The Capital Projects Levy that was voter-approved in May of 2015 was defined at the February 9, 2015 Board meeting. An excerpted section of those minutes is pasted below, with a few items emphasized for clarity.

> *The board also finds and determines that it is necessary and expedient for the school district to submit a capital project levy authorization to fund technology to the voters for their approval.* ***The proposed authorization for technology will be in the amount of 5.837584% times the net tax capacity of the school district.*** *The proposed capital project levy authorization will raise approximately $2,500,000 for taxes payable in 2016, the first year it is to be levied, and would be authorized for ten years. The estimated total cost of the projects to be funded by the proposed capital*

project levy authorization is approximately $25,000,000. The money raised by the capital project levy authorization will be used to provide funds for the acquisition and maintenance of technology and technology systems, and to pay the costs of technology-related personnel and training.

One purpose of this specific report is to provide on-going documentation not just about the entirety of technology department funding and initiatives, but also to clearly note the impact of the levy on the district's technology program. Transparency in this regard helps in reassuring the community that what was voted on is what is actually happening. It also builds a long-term picture of the impact of that spending and allows the district to understand what will be needed in order to maintain technology once the levy term ends. It should also be noted that the levy funding is based on a percentage, not a fixed amount. A review of the total expenditures billed to the levy will show close to 3 million dollars for 2018-2019. The estimated amounts in the board motion reflected the first year of assessments based on property values at the time. As property value goes up, the assessed levy goes up (again, because it is based on a percentage of value).

Surplus equipment sales revenue

Maintaining a consistent and predictable replacement cycle for devices and other hardware helps to ensure that we have well-functioning equipment in the district and also clarifies budget expectations from one year to the next. There are fewer surprises with items breaking down and better overall reliability. Whenever possible, we will sell off any surplus technology, with the monies (currently) returning to the general fund. In the past two years we have recouped over $300,000 in surplus sales.

2017-2019 Surplus Equipment Sales

Date	Device Type	Device Count	Winning Bidder	Revenue
2017 - October	iPad Minis	585	iPhone Antidote	$51,540.00
2017 - December	MacBook 11" Air	182	Tech Defenders	$48,600.00
2018 - March	MacBook 11" Air	330	Second Life Mac	$101,397.00
2018 - March	iPad Various	124	Second Life Mac	$5,330.00
2018 - August	MacBook various	261	Tech Defenders	$68,020.00
2018 - September	iPad Various (4th gen mostly)	528	iPhone Antidote	$36,038.00
2018 - October	Chromebooks - HP G1	219	Classform	$845.00
2019 - February	iPad various 2nd, 4th, Mini 1st and 2nd gen	750	Second Life Mac	$34,310.00
2019 - May	MacBook various (2/3 damaged stock)	321	TBD	TBD

Device Insurance Overview

The district currently offers 1:1 device insurance at rates of $20 annually for iPads and $60 annually for MacBooks. The charts below show annual collections and expenditures.

Rates for the upcoming year are generally set sometime around April. Insurance pool money is only used for repair of devices for which the family has actually paid into the pool. Repair costs for any device for which insurance was waived (due to financial hardship) are covered from the general tech budget. If insurance is declined, repair fees are billed back to the family.

The factors we look at when setting the rate include the initial cost and repair cost of the device, number of devices deployed, amount of stock we need to maintain to ensure that a replacement device is always available, and costs associated with tracking inventory and repair processes and labor for those tasks.

Over time we have gotten more efficient with repairs and making determinations about what types of damage are actually worth repairing given the current value of the device. Taking total cost of ownership and resale value into account has helped establish a healthy reserve for repair costs while allowing us to set rates significantly below what is charged by 3rd party providers.

Insurance Pool Collections and Expenditures

	iPad Fee[1]	MacBook Fee[1]	Insurance Pool Collections	Debits from Pool	Pool Annual Balance	% Used	Pool Running Balance
FY16	$25	$75	$76,432	$19,125	$57,307	25%	$57,307
FY17	$25	$75	$110,858	$79,694	$31,164	72%	$88,471
FY18	$25	$75	$126,317	$37,154	$89,163	29%	$177,634
FY19*	$20	$60	$98,060	$38,542	$59,518	39%	$237,152
FY20	$20	$60					

* As of 4/25/2019.

[1] Rates lowered in 2018-2019 and will remain at that level for 2019-2020.

Repair Costs and Funding Sources for Student Devices

	Insurance Paid - Insurance Pool	Insurance Waived – Tech Budget	Insurance Declined - Billed Back to Family
FY16	$19,125	$3,936	$-
FY17	$79,694	$29,974	$7,082
FY18	$37,154	0	$1,077
FY19	$38,542	$3,576	$1,012

Staffing

As the quantity of devices and overall dependence on technology throughout the district has increased, staff have been added to ensure that we have qualified personnel in place to support all of our users and systems. To put this in the context of the budget, current staffing listed below notes the funding source, which encompasses salaries and benefits.

Tier	Role	Name	Building	Fund
4	Director of Instructional Tech	Bryan Drozd	District Office	General
4	Instructional Tech Supervisor	Chris Lee	District Office	General
	Administrative Assistant	Holly Anderson	District Office	General
3	Systems Admin - Student	Ty Willmsen	District Office	General
3	Systems Admin - Finance	Michele Carpenter	District Office	General
3	Systems Admin - Network	Quazi Jahangir	District Office	General
3	Manager of Technology	Nathaniel Strauss	District Office	General
3	Systems Admin - Servers	Dave Ryan	District Office	General
	Theater Manager	Bob Cole	High School	Levy
2	Tech Systems Support Specialist	Amanda Holm	District Office	General
2	Tech Systems Support Specialist	Colin O'Brien	District Office	General
1	Building Tech	tbd	High School	General
1	Building Tech	Alyssa Hawes	High School	Levy
1	Building Tech	Doug Lopez	High School	General
1	Building Tech	Alex Gause	High School	Levy
1	Building Tech	Emerald Petersen	East	General
1	Building Tech	tbd	East	General
1	Building Tech	Pilar Rodriguez	West	Levy
1	Building Tech (.5)	Jen Reis	West	General
1	Building Tech	Joel Strehl	Sweeney	Levy
1	Building Tech	Chris Walberg	Jackson	Levy
1	Building Tech	Scott Carpenter	Eagle Creek	General
1	Building Tech	Bradly McGarr	Red Oak	Levy
1	Building Tech	Vatoua Yang	Sun Path	General
1	Lead Assistive Tech	Jonathan Benz	CFC	SpEd
1	Building Tech	Maria Hawes	District Office/TLC	General
TOSA	Assistive Tech Coach	Julie Philliips	CFC	SpEd

TOSA	Digital Learning Coach	Kara Osmundson	High School/TLC	Levy
TOSA	Digital Learning Coach	Jeff Jackelen	East Middle School	East
TOSA	Digital Learning Coach	Eric Hills	West Middle School	West
TOSA	Digital Learning Coach (.5)	Sandra Riehl	High School/CFC	Levy
TOSA	Digital Learning Coach	Katie Davis	Sweeney	Levy
TOSA	Digital Learning Coach	Natalie Weatherman	Jackson	Levy
TOSA	Digital Learning Coach	Lindsay DeJong	Red Oak	Levy
TOSA	Digital Learning Coach	Kevin Sayers	Sun Path	Levy
TOSA	Digital Learning Coach	Doug Keddie	Eagle Creek	Levy

Technology Staff Roles and Responsibilities

The staffing of the technology department has kept pace with the deployment of technology and the expectations for how it will be used. Two key areas identified for use of levy funding were training and tech support staffing; the growth of the department and staff focus has been consistent with that directive.

Building Tech/Tier 1

These are our front-line tech support personnel, each assigned to a specific building. They have the most direct contact with staff and students and handle a wide array of issues each day.

Tech Systems Support Specialist/Tier 2

This position focuses on identifying common issues amongst buildings, noting problems to be escalated to Tier 3, and working with vendors for support or repair tasks. They are also very involved with onboarding of new staff and training on Tier 1 technology staff.

System Admins & Database Support/Tier 3

Staff in this group handle the more system-specific tasks, such as maintaining staff and student databases, network functionality, global management of devices, and resolution of issues that are escalated beyond Tiers 1 & 2.

Tech Support Supervisor and Director/Tier 4

Decisions affecting the department or district are made at this level. Staff in this group are also responsible for maintaining the budget and coordinating the efforts and direction of the department.

All of the technology staff listed above are also integral to departmental **communications** and day to day **support**. Examples of these efforts include:

- District website additions: A Technology section under the Parents/Students menu on the district website includes information about device roll-outs and procedures, software

commonly used by parents, and Internet safety. (Found here: http://www.shakopee.k12.mn.us/domain/1962)

- More frequent tech updates to staff: Timely information about technology issues or anything that may be impacting staff are sent out as needed.

- Tech newsletter: Every month or so a tech newsletter goes out to all staff with a more detailed overview of current or planned technology initiatives. We also occasionally use the newsletter format for troubleshooting updates. Here are some recent newsletters (links available here: https://techtools.shakopee.k12.mn.us/display/ITKB/Tech+Department+Newsletters):

- Department meetings: To address concerns within the department about how well everyone was being kept informed, we now provide a weekly overview of current and resolved issues, projects, and other useful information.

- Help Desk: In spring of 2016 we switched to a different help desk software solution that is more user friendly, intuitive, and allows for a better overall support interaction with staff. (Overview of new software: http://www.webhelpdesk.com/help-desk-software). We have since opened up access to that system to students and parents.

Digital Learning Coaches/Teachers On Special Assignment (TOSA)

Whereas the staff at various Tiers of tech support are tasked to ensure that technology is functional and equitably allocated throughout the district, the Digital Learning Coaches (DLC) have a focus on how that technology is integrated into the classroom to be used as an effective tool for our staff and students. Much of their work has parallels to what our Instructional Coaches do and crosses over into the realm of our Teaching & Learning staff. Significant areas of work for the DLCs involve professional development, communication, advocacy of best practices in technology integration, and managing the Learning Commons spaces (formerly the media centers). A few examples of these efforts include:

Professional Development

- On-going PD opportunities scheduled at the buildings by request of staff or administration
- Coaching cycles with teachers
- Sessions at professional development workshop and early release days
- Summer workshops
- Self-paced learning modules (in Canvas)

Communication and Best Practices

- Newsletter (see below)
- Involvement at Parent/Community Information Events (Pearson, Referendum)
- Tech Tools website: blog, tools, resources

- Ongoing PLC Meetings
- District and building technology committees
- District open houses/parent nights
- Device rollouts
- Consulting on curriculum articulation committees
- DLC Facebook page (Shakopee Digital Learning Group)

Catching Creativity Newsletter:
https://techtools.shakopee.k12.mn.us/display/ITKB/Catching+Creativity

Staffing Challenges

Maintaining the presence of a high-quality technology staff has been a challenge. Within a department of 36 staff, various contractual and at-will employee agreements are represented, including the SEA Teacher contract, MSEA Para-educator contract, Secretary Group agreement and Unaffiliated Group agreement. The district has been an effective job training center for technology staff, turning over almost 50% of our building tech, system administration, and digital learning coach personnel over the past several years predominantly as a result of not being able to compete with the marketplace. More concerning is that we lose more staff to other public institutions (schools or government entities) than to the private sector. Salary, benefits, and opportunities for advancement and professional growth are the most commonly cited concerns for exiting staff.

Devices

This section focuses on student and staff devices to be found throughout the district. It should be noted that one of the goals of the Capital Projects Levy was to provide much greater access for students to technology. As of this year, the student device goals that were outlined in encouraging a "yes" vote for the Levy have been met.

Supported Devices/Operating Systems

We try to standardize wherever possible in order to increase reliability and make our systems easier to maintain. However, meeting a variety of needs from both a curriculum perspective and a business process point of view means that we have to support a wide variety of hardware and software. The chart below provides an overview of the most common hardware and operating systems in use throughout the district.

Operating System	Notes
MacBooks ***Apple MacOS***	MacBooks run the Apple MacOS operating system. The most current version we support is called High Sierra (version number 10.13.x), We are still migrating devices off of the previous version, called Sierra.
PCs ***Microsoft Windows***	Most PCs have been migrated to Windows 10, with some still on Windows 7. Updates to the operating system are centrally managed using a management tool called SCCM.
Chromebooks ***ChromeOS***	Chromebooks use ChromeOS. Updates are centrally managed to a large extent, but can be forced or delayed on machines by the user.
iPads ***Apple iOS***	iPads, iPods and iPhones run the Apple iOS operating system, with most devices currently on version 12. Updates are generally initiated and run by the user.
Android Tablets ***Android OS***	We have a small batch of tablets running the Android operating system; this is similar to what one would find on an Android phone.

Device Distribution/Inventory Counts (FY16-FY18)

Computers are just one category of many pieces of hardware in use throughout the district. Later sections of this report will speak to "everything else. As the district that has aggressively pursued a 1:1 program and increases in device availability and mobility over the past several years, it makes sense to start with those totals. The chart below provides totals for each major category of device over the past 4 years. As of FY20, we will have full deployment for iPads and MacBooks. As one would expect, the number of PCs has dropped and will likely drop a little more before stabilizing. The heaviest use of PCs among students involves the Project Lead The Way (PLTW) curriculum, which is still primarily (although not entirely) dependent on

the PC platform. Chromebooks exist almost exclusively in carts and are handy for situations such as assessment and keyboard intensive assignments.

Device Totals	PC	iPad	MacBook	Chromebook	District Total
FY16	2673	3375	1593	933	8574
FY17	2560	3736	3466	731	10493
FY18	1422	5805	3401	1184	11812
FY19	1114	5831	3547	1129	11621

1:1 Home Internet Access

One of the challenges for a 1:1 program is Internet access at home for students. While the majority of our households have Internet access at home, some do not. Students have the option to request a wireless hotspot device (also known as a "mi-fi") for use outside of school. The district underwrites the cost of these devices, though a portion of that cost was defrayed by a $36,000 grant from the state.

Device Allocations for 2019-2020

This section provides an overview of where many of our devices are allocated. There may be some minor differences between buildings, but we strive to provide equitable resources across grade levels and schools. Classroom labs (such as those using Project Lead the Way curriculum, which generally uses a PC lab) are not included here.

The charts that follow show the growth of device distribution at elementary and secondary over the past few years, as well as the shift between device types over time. **One significant impact is the decline of PC labs, which also allows for those lab spaces to be reclaimed as classrooms.**

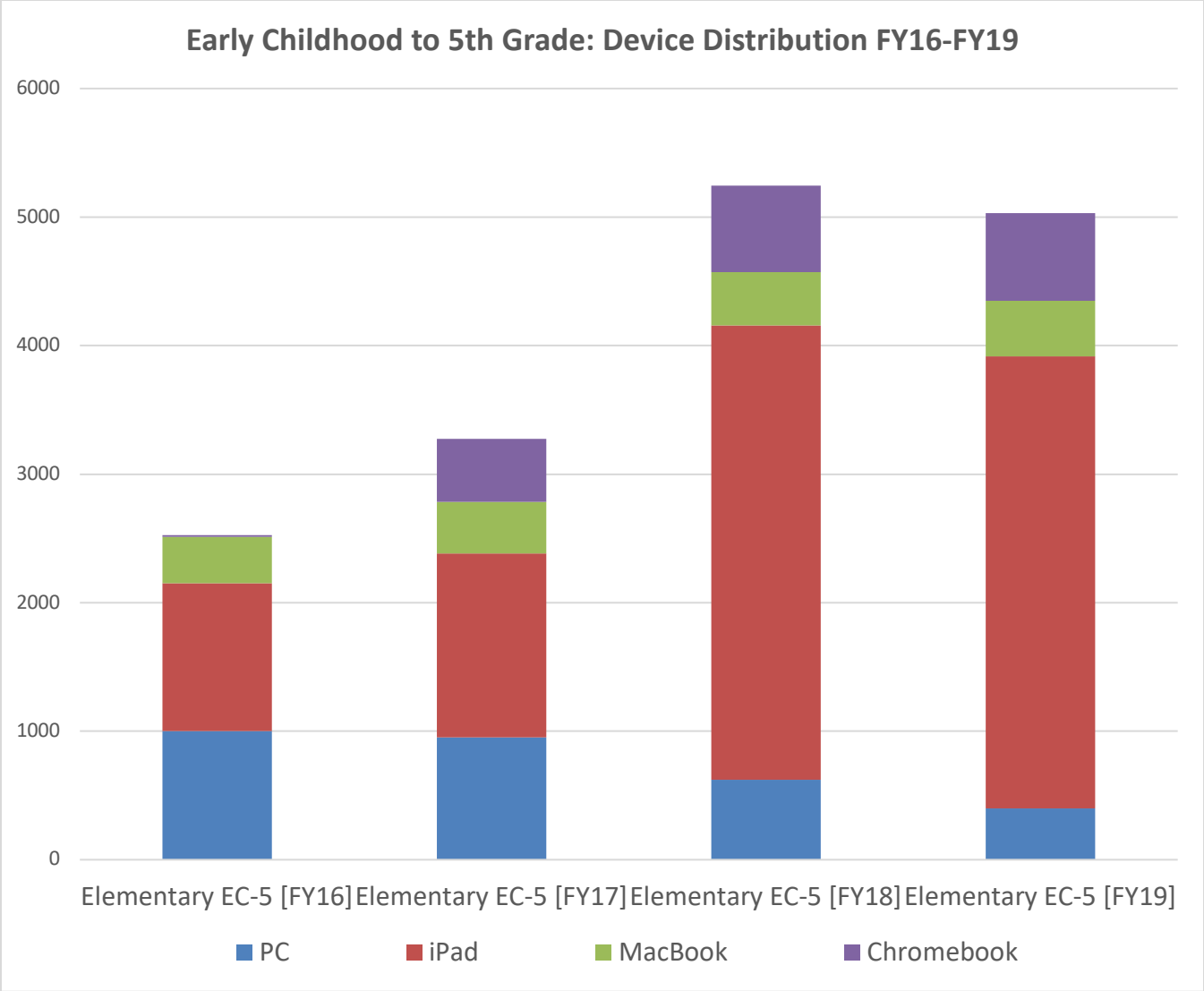
<u>CFC</u>
2 iPad carts (approximately 70 devices)
1 Chromebook cart

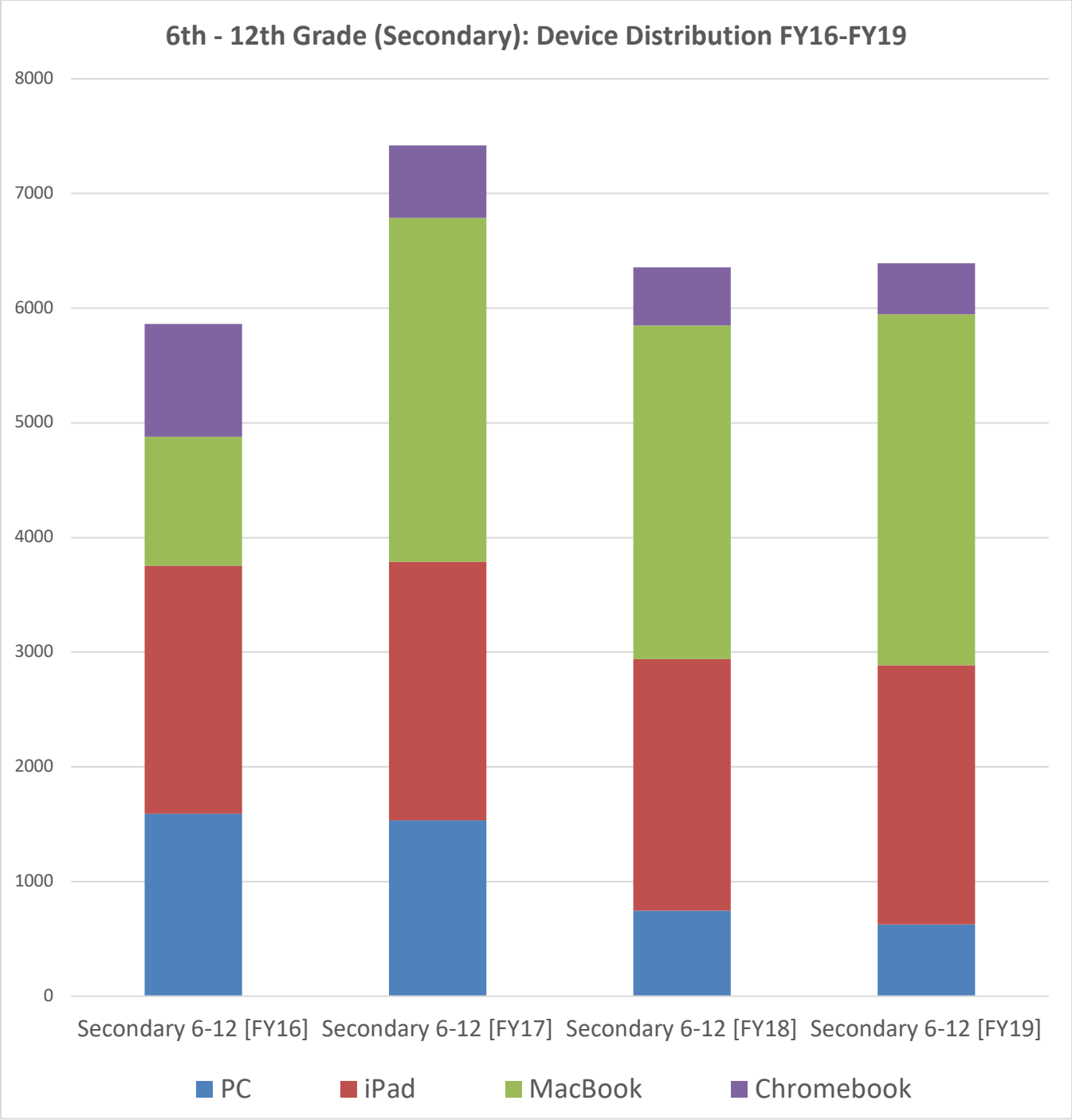
<u>K-5 Buildings</u>
1 iPad cart (for checkout)
4 Chromebook carts
K classrooms: iPad carts 1:2 ratio (1 device: 2 students)
1-5 classrooms: iPad carts 1:1 ratio

<u>Middle Schools</u>
5-6 Chromebook carts
1:1 iPads

<u>High School</u>
1:1 MacBooks
2 PC general use Labs

<u>Tokata</u>
1:1 MacBooks
1 Chromebook cart


Early Childhood to 5th Grade: Device Distribution FY16-FY19
6000
5000
4000
3000
2000
1000
0
Elementary EC-5 [FY16]
Elementary EC-5 [FY17]
Elementary EC-5 [FY18]
Elementary EC-5 [FY19]
PC
iPad
MacBook
Chromebook


6th - 12th Grade (Secondary): Device Distribution FY16-FY19
8000
7000
6000
5000
4000
3000
2000
1000
0
Secondary 6-12 [FY16]
Secondary 6-12 [FY17]
Secondary 6-12 [FY18]
Secondary 6-12 [FY19]
PC
iPad
MacBook
Chromebook

Device Replacement Cycle

Establishing a clear and specific replacement cycle for devices helps in accomplishing several goals:

- Ensure that devices can handle the latest software requirements.
- Reduce expenditures on maintaining older devices.
- Allow the district to recoup some costs by selling off surplus devices while they still have value.

It should be noted that many of our devices are currently being acquired through lease agreements with a buyout option at the end of the lease. In many cases, devices are repurposed beyond their replacement cycle. If there is not another use for a device, we will declare it surplus and sell it to the highest bidder. The flexibility of being able to use devices beyond the lease agreement and the ability to recoup value for devices through resale are why we do a buyout to take ownership of the devices. Leasing has been necessary as part of establishing a 1:1 technology program, but the long-term goal should be to reduce our dependence on leases.

Device Group	Replacement Cycle
K-1 Carts (1:1 iPads as of FY21)	4-5 years
2-5 Carts (1:1 iPads as of FY20)	4 years
6-8 1:1 iPads	3 years
9-12 1:1 MacBooks	4 years
Staff MacBooks	5-6 years
Staff iPads	5 years
PLTW Labs (PCs)	4-8 years
Office Staff PCs	4-6 years
Chromebooks	4-5 years

Moving forward, 2nd grade and 6th grade iPads along with 9th grade MacBooks are deployed as new devices to students, meaning they are an annual purchase. For the 2019-2020 school year, new devices will be acquired for 1st, 2nd, 6th and 9th grade. We also anticipate a refresh of a Project Lead the Way lab at the High School and the continuation of the Chromebook refresh cycle.

Services, Supplies, Software & Capital Expenses

This section focuses on our systems related to technology infrastructure (capital expenses) and our most widely utilized software. Services and supplies are not covered much here; they are not a huge portion of the budget but include more of the mundane aspects of technology such as bulbs for projectors, outsourcing for repair, annual service contracts, and so forth.

Infrastructure - Security, Life Safety and Building Operations

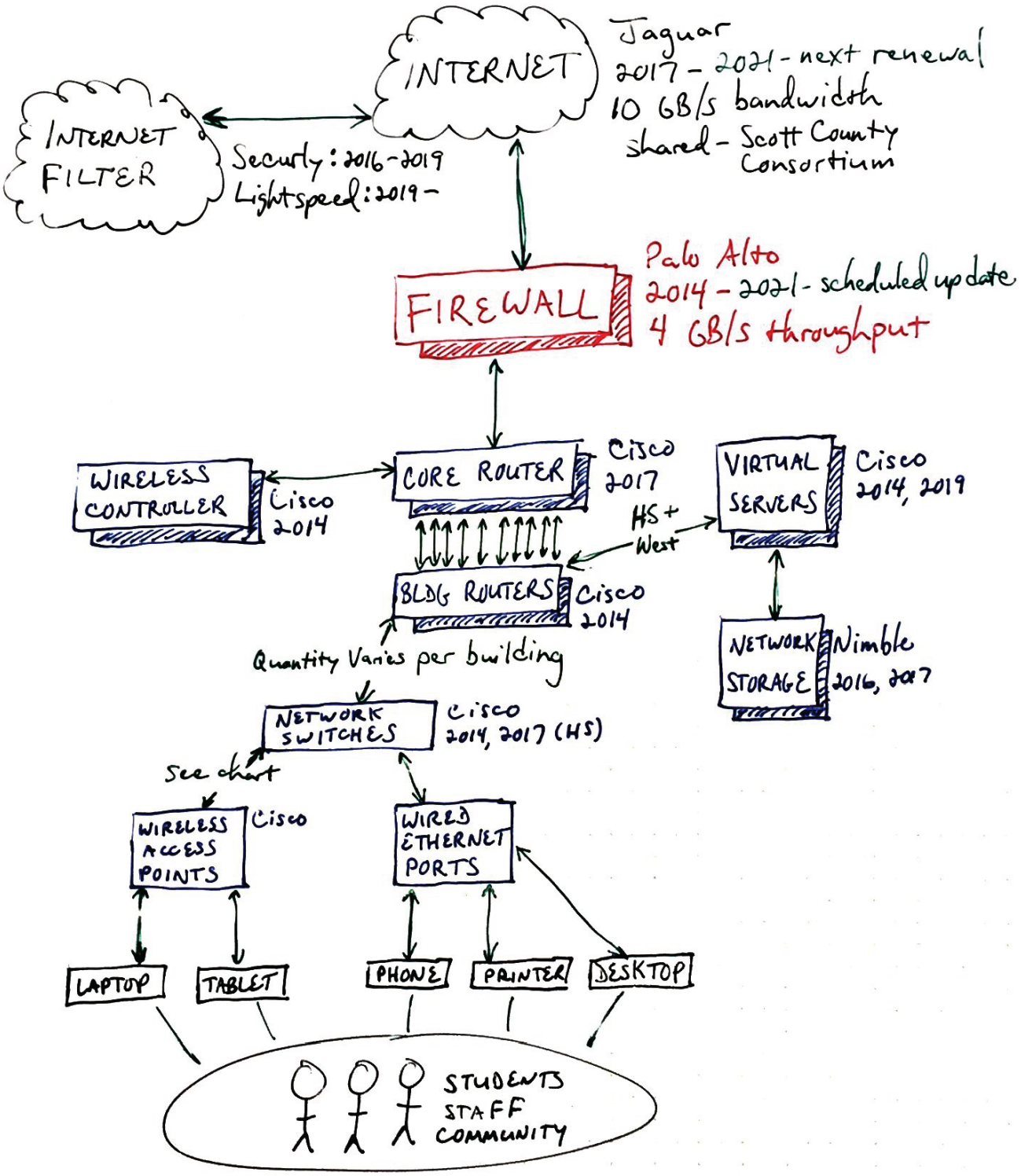
We cooperate with Buildings & Grounds on maintaining and improving our security-related systems and providing a more unified and interconnected design for those systems. The district's current systems include:

- Keycard door entry (S2)
- Visitor background check and badge (Lobbyguard)
- Internal and external surveillance cameras (Exacq)
- Bell/clock systems (varies)
- Entrance camera and intercoms (Aiphone)
- Building intercoms (varies)
- Phone system (Shoretel/Mitel – some integration with building systems)

We continue to explore upgrades and integration within these systems. In addition, capacity for emergency alerts, panic buttons, and other mass communications tools are also being examined. Ultimately, our goal is to have systems in place that are simple to use, consistent between buildings, and which function just as reliably in day to day use as in an emergency situation.

Infrastructure – Network, Servers & Data Security

Each year we have more devices on the network and increase our reliance on local and cloud-hosted services. We are continuously monitoring how the network functions and taking time to identify current and potential bottlenecks or trouble spots. This section details various components of our infrastructure and how each plays a role in maintaining a well-functioning network and systems.


INTERNET
Jaguar
2017 - 2021 - next renewal
10 GB/s bandwidth
shared - Scott County Consortium
INTERNET FILTER
Securly: 2016-2019
Lightspeed: 2019 -
FIREWALL
Palo Alto
2014 - 2021 - scheduled update
4 GB/s throughput
WIRELESS CONTROLLER
Cisco 2014
CORE ROUTER
Cisco 2017
VIRTUAL SERVERS
Cisco 2014, 2019
HS + West
BLDG ROUTERS
Cisco 2014
Quantity Varies per building
NETWORK STORAGE
Nimble 2016, 2017
NETWORK SWITCHES
Cisco 2014, 2017 (HS)
See chart
WIRELESS ACCESS POINTS
Cisco
WIRED ETHERNET PORTS
LAPTOP
TABLET
PHONE
PRINTER
DESKTOP
STUDENTS
STAFF
COMMUNITY

Internet

We purchase access to the Internet through Jaguar Communications as a member of the Scott County Network Consortium (consisting of Shakopee, New Prague, Prior Lake, Belle Plaine, Jordan). A portion of the cost for Internet is offset via E-rate and Telecom Equity funding. Our current Internet contract runs through 2021.

Internet (Content) Filter

We are switching to Lightspeed Relay filtering in summer 2019. After reviewing various vendors, we feel this option provides helps address issues with managing the user experience and improving overall ease of use. We have signed on with Lightspeed through 2022.

Firewall

A firewall is the first line of defense. It is the traffic cop, looking at every piece of data flowing in and out of our network and sending it to the proper destination. Two Palo Alto firewalls were purchased in 2014; we expect to replace them in 2021. The capacity of a firewall must be properly matched up to the peak potential traffic on the network; our current hardware is sufficient but we expect to exceed the capacity of the device over the next five years.

Core and Building Routers

The core and building routers are the primary network equipment that carries traffic between buildings. These are generally bought in pairs to minimize the possibility of a building completely losing communication.

Wireless Controller

The wireless controller manages every wireless access point in the district. It is the "big brain" of the system. This is also a device we buy in pairs since if it goes down, all wireless devices (in other words, most of what our staff and students use) lose network access.

Network Switches

All of that network cable has to plug in somewhere. Traffic in a building is routed primarily through network switches. Most of our network devices are about 4-5 years old. We do not have any immediate critical needs in this area but will monitor performance of the network and develop a replacement plan to ensure optimal operation. The addition of more security cameras has required tapping into network switch capacity and adding cabling.

Wireless Access Points

Our system of wireless access points is on a continuous refresh cycle. At the moment there are 842 wireless access points in use. The access points are centrally managed through the wireless controller.

	Access Points
Central Family Center	42
Eagle Creek	60
Jackson	64
Red Oak	55
Sun Path	56
Sweeney	51
Pearson	42
East Middle	71
West Middle	83
High School	283
Tokata Learning Center	8
District Office	27
	842

Virtual Servers

We are continuously upgrading servers and moving as many as possible to virtual environments. This allows more uptime, lower cost, and easier upgrades. We still need physical hardware to run virtual servers, but we can aggregate those virtual servers onto fewer physical systems, lowering overall long-term costs. A recent project involved upgrading the server hardware and creating a redundant system for ensuring server uptime and availability.

Network Storage

In order to maintain virtual servers and shared network storage & databases we have had to increase our available capacity. This is an on-going project related not only to storage and servers but also disaster recovery.

Infrastructure - Services & Management

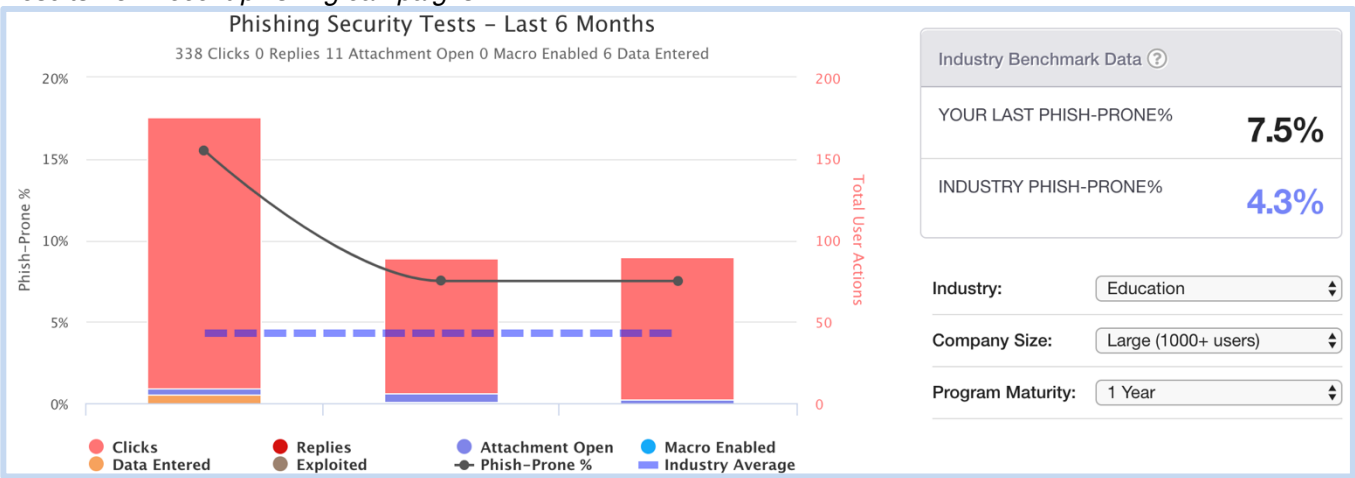
E-mail Archiver

We presently use an on-site system called GFI Archiver to back-up all of our incoming and outgoing e-mail (just the perceived legitimate items, not any spam that doesn't make it past the filter). We also redundantly archive using an option built into Office 365 for this purpose. Meanwhile, in our Google environment we use the free Google Vault service for e-mail archiving (more about Vault here: https://apps.google.com/products/vault/).

Phishing Training

The district uses a service called KnowBe4 to help train staff on how to recognize and avoid attempts at e-mail phishing. "Phishing" is a technique for disguising the sender or intent of an e-mail in order to trick users into clicking a potentially malicious link or in some way providing information to a third party. It can also be used to deliver damaging malware or ransomware to devices. Since there is no way to completely block these devious e-mails, our strategy now is to try to train staff in recognizing the warning signs and avoiding being "phished". Recent results **show improvement but a need for continued growth in this area**.

Results from recent phishing campaigns.



Account Management

In summer of 2017 we put in place a new system for account management. This was necessary in order to automate processes related to account creation, password maintenance, and assignment of accounts to security and distribution groups. The system (referred to as RapidIdentity) also gives staff greater control over managing their accounts and handling time-sensitive issues without intervention from technology staff, such as unlocking student accounts (which can be necessary after multiple failed login attempts) and helping students with password issues.

Management & Automation Systems

A system as large as ours requires the use of automation and management tools. Running these systems and ensuring that they are properly configured and maintained is a significant job duty for technology staff in a system administrator role.

A summary of major systems utilized for managing our environment and automating daily tasks.

System	Purpose	Lead Tech(s)
JAMF Pro	• MacBook, iPad and AppleTV configuration and inventory. • Deployment of software and apps to those devices. • Maintenance of app catalogue.	Nathaniel Strauss
Microsoft SCCM (System Center Configuration Manager)	• Windows PC deployment, imaging, and inventory. • Managed updates of software.	Dave Ryan
Clever	• Pulls data from Infinite Campus and passes it to other programs for the purpose of setting up accounts, populating class lists, and maintaining up to date records.	Ty Willmsen
Cisco Prime	• Cisco wireless access point deployment, configuration management, and inventory.	Quazi Jahangir
Solarwinds Orion	• Tool for network monitoring, troubleshooting, and outage alerts.	Quazi Jahangir
Papercut & Uniflow	• Monitor all printer usage in the district. • Manage printer restrictions, such as print release stations or quantity limits.	Dave Ryan & Colin O'Brien
RapidIdentity	• Uses data from Infinite Campus to automate the creation and management of user accounts, security and distribution group membership. • Handles password resets.	Chris Lee & Ty Willmsen

Infrastructure - Phones

We will be updating our phone system (a Shoretel system from 2006) in summer of 2019. The new system is essentially the next generation of our current system, but offers enough new functionality and improvements to make it worthwhile. It also allows us to leverage existing hardware and configuration, which will help ease the migration process.
The upgraded system was chosen after a rigorous vetting process. This process included consulting to develop a detailed request for proposals document. Seven vendors submitted proposals, which were eventually whittled down to two finalists. It is expected that the Mitel Connect system that we will be installing this summer will result in a cost of about $410,000 over seven years, with about 60% of that cost occurring in the first two years as part of the implementation.

Multimedia/Audio-Visual Hardware

A typical classroom has some form of digital projection (interactive whiteboard with digital projector, digital projector alone, or large screen television) and audio support. The K-5 buildings are more likely to have a Smart brand interactive whiteboard, Middle School buildings are mixed, and the high school tends to have digital projectors or large screen TVs.

The charts below provide some background on our deployment of Apple TV streaming devices and our interactive whiteboard inventory. The Apple TV chart will look very different after summer, as we will have completed a refresh cycle on that equipment which will result in the phase-out of all 2nd and 3rd generation versions of the device.

Apple TV devices currently deployed

Location	2nd Gen*	3rd Gen*	3rd Gen R2*	4th Gen	Grand Total
Central Family Center			3		3
District Office		1	17	7	25
Eagle Creek Elementary			53		53
East Middle School		3	63		66
High School			59	97	156
Jackson Elementary		1	53		54
Pearson			42		42
Red Oak Elementary			55	1	56
Sun Path Elementary	1	1	48	1	51
Sweeney Elementary			44	1	45
Tokata Learning Center			8		8
West Middle School		1	66		67
Offsite			3		3
Unlisted Location (Stock)		1	4	83	88
Grand Total	1	8	518	190	717

Interactive whiteboards currently deployed

Model	Count	% of total	End of Support
Smart M600 DViT	2	1%	
Smart SB660	6	2%	9/1/2018
Smart SB680	257	79%	10/31/2019
Smart SB685	4	1%	10/31/2019
Smart SBM680	22	7%	
Smart SBX880	1	0%	
Smart SD680	28	9%	
Hitachi Starboard	7	2%	
Grand Total	327		

In the spring of 2019, an Audio-Visual Committee met to review our options and determine next steps for replacing or upgrading classroom audio-visual solutions. The goal of the committee was to identify our most critical needs and any barriers to upgrading audio-visual equipment. **A key issue that we will need to resolve in the future is our dependence on Smart Notebook software, since certain curriculum materials have been built using that software and are not available elsewhere.** This is potentially problematic as we have seen diminished support for the software from the vendor, especially for the Mac version of the program (which is what our staff predominantly use).

In summer of 2019, we will do a pilot room installation at each school in order to further assess our options. The plan right now is to make some determinations in spring of 2020 about our next steps and to start developing timelines and budget moving forward.

Printing & Copiers

Our current printer and copier inventory is comprised of approximately 200 devices. In 2016 we upgraded the oldest portions of our desktop printer fleet (replacing printers from 10-15 years old). In 2018 we upgraded the multi-function printer/fax/copier portion of the fleet that is used most heavily in the school offices and departmental areas. The overall deployment of printers is down by about 12 since two years ago due partially to Pearson being closed but also due to more efficient placement of devices to eliminate redundancy. We have also switched vendors for managed print services (Loffler) in order to get more competitive pricing, which has led to year-over-year reductions in cost.

Inkjet Color	Laser BW	Laser Color	Laser Color Print/Copier	Grand Total
3	140	20	28	191

In addition to the printing fleet, we also have 9 high-volume copiers (managed through Advanced Imaging Solutions). These are located primarily at the district office, high school and the central duplicating center at CFC.

Software – District Level

The district spends a significant amount each year at the district level on software and web-based applications. Some of the purposes/functions of these include: Managing student data, student learning tools, network management and security, and office/school communications and efficiency. Provided below is a list of the more significant pieces of software. There are numerous other software applications in use throughout the district, but this chart represents some of the most widely used and also provides a sense of the annual budgetary impact. Whenever possible, we look for more cost-effective options.

Software	Purpose	Annual Cost
Adobe Suite	Collection of photo editing, video editing and creation, website design, publishing and PDF software.	$23,000
Canvas (Instructure)	Learning management system.	$70,000
Follett/Destiny	Library collection management & database.	$24,000
Frontline • Aesop • Applitrack • Central (Forms) • Professional Learning Management • Veritime	Various functions, including: Staff entry of time off requests. Substitute teacher availability and placement. Staff professional growth tracking and certain courses. Employment applications and interview scheduling. Employee time-clock.	$91,000
Infinite Campus – Finance	Payroll, HR, Finance database.	$75,000
Infinite Campus – Student	Student Info, Gradebooks, Transcripts, Food Service, Communications.	$110,000
JAMF Pro	iPad, MacBook & AppleTV management tool.	$70,000
Microsoft	Licensing – all operating system (Windows), server, Office, Office365, and Exchange e-mail.	$60,000
Network Performance Monitor (Solarwinds)	Monitors network traffic for trouble spots and allows better diagnosis and correction of performance issues.	$7,000
Laserfiche	Document archiving.	$14,000
SchoolWires (Blackboard)	District & School websites.	$16,000
Seesaw	E-5 classroom communications and student work portfolio.	$18,000
WebHelpDesk	Technology help desk and inventory.	$4,000

Software With Parent Connections

Canvas Learning Management System

The primary function of Canvas is to allow teachers to create an on-line environment for delivering instruction, distributing and collecting assignments, and providing formative and summative assessment. It is also being used for some professional development, particularly training of new staff but expanding into other on-going training as well.

- Grade Levels Using Canvas: 6-12, with plans to start using in elementary.
- Parent Connection: Parents can set up logins and observer accounts that allow them to monitor how students are using the software.

Infinite Campus

Our system of record, which handles all of our state reporting, enrollment, attendance, student records, and so on. It is also our human resources, payroll, and finance system. Additionally, when staff or student records are created, changed or exited, it serves as the starting point for our system of automating the transfer of those account changes to systems such as Google (such as all of our @shakopeeschools.org accounts), Microsoft (management of logins, @shakopee.k12.mn.us accounts, and Office licensing) , and Clever (syncing of account data to systems such as Seesaw).

- Grade Levels Using Infinite Campus: All
- Parent Connection: Parents can set up a portal account to view student records, update contact information, check lunch balances, pay fees, and communicate with staff.

Seesaw

We use Seesaw as a platform for sharing student work and communicating with parents. We chose to use Seesaw when we realized that many elementary staff were either using it already or were using a variety of other tools to enhance home-school communication. Being on a common platform simplifies that process while also ensuring that we can properly manage and protect student data.

- Grade Levels Using Seesaw: EC-5
- Parent Connection: Parents are provided a code to create an account and connect to their child's classroom.

Other tools that the district uses for communication include our district website, the Messenger functionality in Infinite Campus, e-newsletters sent out through MailChimp, and an occasional survey produced in SurveyMonkey. In addition, our schools use various tools to produce newsletters, with several currently using Smore. While we strive to communicate as much as possible about what is happening in the district, we also realize that an overabundance of such tools can be a strain on parents and are continuing to refine our usage of these tools and also seize on opportunities to be more consistent in what tools we use and how and when we use them.

Department Initiatives & Updates

Projects

In addition to various projects discussed throughout this document, here are a few other projects that are in various stages of research or completion.

Disaster Recovery

When we talk about "disaster recovery", we are referring to several distinct situations. Can we handle a temporary disruption to the network? Can we ensure access to our local data? Can we continue to provide functionality after a catastrophic event? At this moment, the answer to any of those questions is a less than satisfying "mostly". That being said, we have identified many of our weak spots and have already made progress in addressing those deficiencies. As noted earlier, we have several examples of redundant systems, including our firewall, wireless access point controller, core switching equipment, virtual server hosting and network storage. Our long-term objective is to set up the High School and West Junior High as our redundant sites, meaning that if one site goes down the system can "fail-over" to the other site. Work remaining to get to that point includes obtaining an Internet connection through an alternate vendor and some contracted consulting work to ensure that everything is set up correctly. The take-away for disaster recovery is that we are aware of our weaknesses and have plans in development to address those areas.

Google Drive Reorganization

We will be taking steps to better organize how files are stored in Google Drive accounts. This includes a more strategic use of Team Drives, which have more robust options for security and file ownership. This is effectively a business continuity initiative, as we have come across several situations where important files are assigned to specific staff; individuals leaving the district should not cause a disruption to access or our ability to use district information and resources, but in the current environment that can happen.

Infinite Campus On-Line Registration

Late this summer we will launch the ability to complete new and continuing school enrollment information via an Infinite Campus On-Line Registration portal. This will provide a more efficient option for parents and hopefully streamline and reduce some of the paperwork involved with registration, while also encouraging more families to use the portal and maintain accurate information in our system.

Student Virtual Library Card

Thanks to a partnership between the Shakopee Public Schools and the Scott County Library, Shakopee High School students will receive a fine-free virtual library card. This collaboration, called the Virtual Student Library Card, ensures that public library resources can be a part of every student's learning experience.
Students can benefit from access to the vast resources available through the public library, including online tutoring and homework help, research tools, eBooks, audiobooks, electronic

magazines, language learning tools, and print books. This virtual card will also allow for the checkout of two physical library items.
Our pilot group for this partnership began May 13th, 2019, and includes next year's 9th-12th grade students. In the 2019-2020 school year, the partnership will extend to middle and elementary school students, so stay tuned for dates and details.
For more information about the Virtual Student Library Card, including how students access their accounts, please visit: bit.ly/VSLClearningcommons.

Summary

As lengthy as this report is, there are plenty of other items that could have been included. This is an update to the 2017 Tech Report. We will continue to produce annual revisions and updates, along with occasional addendums to highlight significant items not included this time around.