BEAVERTON SCHOOL DISTRICT

School Board Meeting
April 24, 2017
Strategic Plan Report Summary

Title: Technology Report

Objective: The objective of this document is to report the state of technology systems functionality and on strategic key measurements of student and staff technology access, as identified by the Board.

Data: Data on percentage of staff and students reporting adequate access to technology is provided through the 2015-16 staff and student surveys. Additional data sources for this report include the Help Desk System, Asset Management System, server and networking systems log files.

Measurements 1 and 2: Staff and student reporting access to technology

Measurement	2013/14	2014/15 Goal	2014/15	2015/16 Goal	2015/16	2016/17 Goal
% teachers reporting adequate access to technology to support their instruction	**46.5%**	**48%**	**49.5%**	**60%**	**66.6%**	**75%**
% students reporting adequate access to technology to support their learning	**83.7%**	**88%**	**85.4%**	**93%**	**91.1%**	**95%**

% teachers reporting adequate access to technology to support their instruction

Beaverton School District	2013/14	2014/15	2015/16
All Teachers	46.5%	49.5%	66.6%
Male	50.2%	59.7%	70.4%
Female	47.7%	51.7%	67.5%
Other			
Asian		50.0%	57.7%
Pacific Islander		80.0%	**%
Black		100%*	**%
Hispanic	42.5%	33.3%	78.0%
American Indian/Alaskan Native		76.9%	**%
White	50.2%	52.2%	68.0%
Multiracial		73.3%	65.2%
Heterosexual	48.5%	53.7%	68.8%
LGBQ	41.7%	52.6%	71.4%

** 4 responses // ** Less than 4 responses*

% students reporting adequate access to technology to support their learning

Beaverton School District	2013/14	2014/15	2015/16
All Students	83.7%	85.4%	91.1%
Male	82.0%	84.8%	90.9%
Female	86.0%	86.7%	92.1%
Asian	84.4%	86.2%	88.0%
Pacific Islander	83.8%	85.4%	86.8%
Black	77.8%	79.1%	81.2%
Hispanic	84.2%	84.3%	89.3%
American Indian/Alaskan Native	80.4%	80.7%	89.5%
White	84.8%	83.8%	91.2%
Multiracial	79.6%	85.0%	86.6%
Heterosexual	80.3%	85.2%	90.4%
LGBQ	74.7%	79.3%	82.7%

Student responses by school

School Name	2013/14	2014/15	2015/16
K-5 Schools			
Barnes Elementary	86.6%	100%	86.6%
Beaver Acres Elementary	94.1%	93.5%	97.3%
Bethany Elementary	89.8%	92.7%	93.8%
Bonny Slope Elementary	95.9%	99.1%	99.1%
Cedar Mill Elementary	100.0%	94.4%	94.0%
Chehalem Elementary	86.6%	92.9%	89.9%
Cooper Mountain Elementary	92.5%	91.1%	95.8%
Elmonica Elementary	82.0%	92.9%	
Errol Hassell Elementary	93.4%	92.1%	92.8%
Findley Elementary	88.0%	94.0%	98.4%
Fir Grove Elementary	90.0%		92.5%
Greenway Elementary	75.8%	79.0%	90.1%
Hazeldale Elementary	87.5%	89.8%	95.5%
Hiteon Elementary	95.7%	94.3%	91.7%
Jacob Wismer Elementary	88.2%	66.7%	95.1%
Kinnaman Elementary	92.5%	93.6%	97.0%
McKay Elementary	73.2%	98.0%	98.7%
McKinley Elementary	84.2%	89.9%	89.2%
Montclair Elementary	93.0%	95.7%	94.4%

Nancy Ryles Elementary	89.7%	95.9%	95.1%
Oak Hills Elementary	95.4%	86.0%	93.0%
Raleigh Park Elementary	89.7%	89.2%	96.2%
Ridgewood Elementary	97.6%	95.9%	91.6%
Rock Creek Elementary	95.3%	93.5%	93.9%
Scholls Heights Elementary	92.1%	88.5%	98.5%
Sexton Mountain Elementary	88.8%	87.8%	97.2%
Terra Linda Elementary	92.6%	99.0%	96.7%
Vose Elementary		94.2%	87.0%
West Tualatin View Elementary	88.1%	86.5%	96.8%
William Walker Elementary	76.0%	90.6%	84.7%
K-8 Schools			
Aloha-Huber Park		100%	95.0%
Raleigh Hills K-8	98.5%	97.5%	94.5%
Springville K-8	90.1%	94.5%	97.9%
6-8 Schools			
Cedar Park Middle	74.1%	83.9%	90.6%
Conestoga Middle	71.2%	86.0%	94.6%
Five Oaks Middle	66.3%	76.0%	76.2%
Highland Park Middle	86.4%	85.4%	93.0%
Meadow Park Middle	69.2%	89.6%	84.0%
Mountain View Middle	70.8%	74.2%	84.3%
Stoller Middle	64.1%	86.1%	85.2%
Whitford Middle	84.4%	87.3%	96.6%
6-12 Schools			
Arts & Communication Magnet Academy	84.9%	74.0%	81.2%
Health & Science	71.3%	83.3%	86.0%
International School of Beaverton	67.3%	78.2%	80.2%
9-12 Schools			
Aloha High	82.4%	67.7%	89.0%
Beaverton High	84.0%	70.0%	94.5%
Community School	81.2%	93.8%	95.1%
School of Science & Technology	63.8%	81.4%	92.1%
Southridge High	85.3%	85.7%	90.5%
Sunset High	89.2%	87.3%	91.9%
Westview High	81.2%	100%	

Successes:

- Student satisfaction levels continue to remain high.
- Staff reporting access to technology to support instruction grew by 17% over prior year.

Issues:

- The timing of the survey was prior to teacher receipt of new teacher laptops during the summer of 2016. While there is significant growth in positive teacher perception, additional research is required to understand and address needs.

Action Plan:

- Work to increase technology support for students and staff continues through bond and general fund investments and is summarized in this report. While not inclusive of all projects within IT, the projects below represent work aligned to increasing staff and student satisfaction of how technology supports their work.

Technology Systems – 2016/17 School Year

Infrastructure Improvements

Technology plays a vital role in student learning and our support of instruction begins with a solid infrastructure. We are concluding our third year of system-wide infrastructure improvements supporting student and staff use of technology for learning.

Internet Access and Dark Fiber Project

The influx of Chromebooks and iPads through FutureReady deployments continues to place demands on the wireless network internally as well as to our overall District internet connection out to the rest of the world. In June of 2016, we finished the school year with a 5 Gigabit connection that was routinely experiencing peak use above 80% daily.

In an effort to meet increasing demand, up to the 40 Gigabit connection recommended in the National Education Technology Plan for a district the size of Beaverton, we began planning a "Dark Fiber" network. A Dark Fiber connection allows the District to enter into a lease for unused fiber optic cables and manage the connections with existing, in-house staff. This arrangement allows the District to upgrade the connection by replacing network equipment without a corresponding cost increase to an internet services provider.

The Dark Fiber project is a collaboration with the Northwest Regional ESD and school districts from Tigard-Tualatin, Hillsboro and Forest Grove. When complete, we will have a dedicated internet connection for the Beaverton School District and a separate connection through our partner districts. The first 10 Gigabit connection was activated in February 2017 and once the new data center comes online, we will add a second 10 Gigabit connection. These two connections will give us a combined 20 Gigabit capacity. We will be able meet immediate

demand and increase connectivity up to 40GB as demand increases. Our Dark Fiber project will allow the Beaverton School District to continue to meet increased internet usage supporting student learning in a highly cost-effective manner.

Enterprise Wireless Network Improvements

Wireless access remains the primary method used by students and staff to access District and internet resources. Our wireless network is critical to both the teaching and learning and the business needs of the organization. The wireless network replacement began in 2014 and all phases of the build-out were completed in June 2016. We continue to monitor usage and adjust access point installations to provide the best access and experience for staff and students. We have begun evaluating stadium needs at the high schools for streaming athletic events and access for coaches and teachers as they use athletic fields for instruction.

Wireless usage, both on the BSD Wifi network for BSD-owned devices and the BSD Guests network for student, staff and community personal devices, continues to experience aggressive growth. Daily wireless usage has almost doubled from September of 2015. From the start of the 2016 school year, use has increased from 36,409 to 43,523 daily clients at the end of March 2017. This increase is due to deployment of FutureReady devices and includes devices staff and students bring to school accessing the guest network.

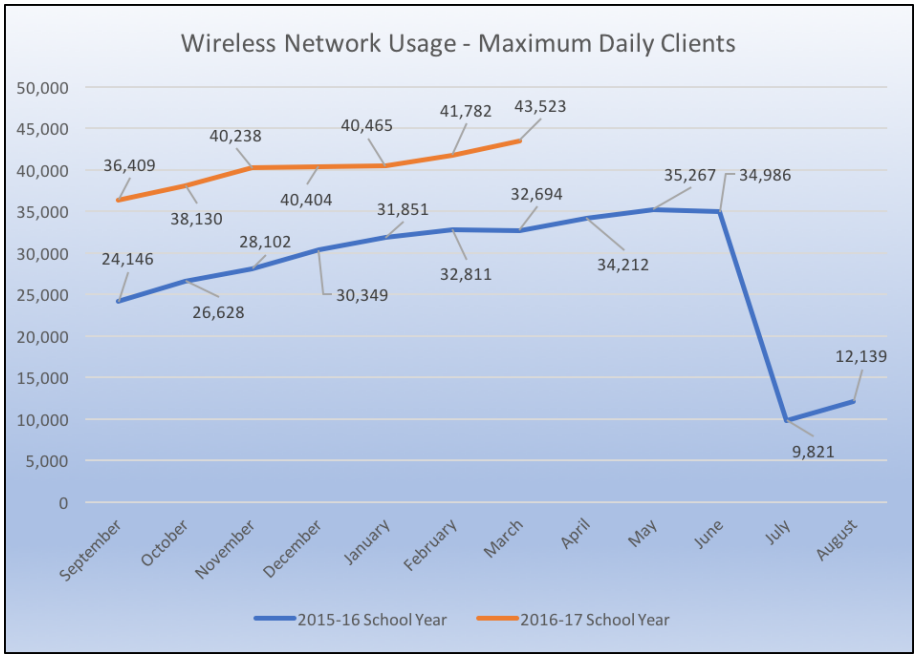

Figure 1: Maximum Daily Clients, Sept. 2015 – March 2017

Telecommunications System Replacement

Phase 3 of the bond-funded Unified Communications system implementation is complete, with all schools and ancillary sites fully converted to the new ShoreTel system. We have begun Phase 4 of the project, which is the activation of numerous safety and security enhancements. Enhanced 911 features have been implemented at school sites. Enhanced 911, or E911, automatically associates the location in the building of a number dialing 911. This association will allow first responders and the Public Safety Office to know the exact location, not just the building where there is an emergency, saving critical time. An additional safety feature implemented during the Fall and Winter months was the ability for all phones to initiate a lock-

down or lock-out event. If a lock-down or lock-out event is triggered, an automated message plays over the school intercom system to alert students and staff. The system also has the ability to lock exterior doors automatically so staff no longer need to manually secure exterior entrances.

Security Audit

The Information and Technology Department takes very seriously the responsibility to protect student, staff and organizational data and has implemented many identified best practices in the areas of privacy and security. Our networks and systems are probed daily from external and sometimes internal sources seeking access. To ensure we are operating with the highest levels of protection, we completed a Next Generation Risk Management security audit of our systems, done by a nationally recognized consultancy. The audit focused on the following areas:

- **Governance:** Access Policies, Acceptable Use Agreements, Back-up, Audit and Accountability Policies.
- **External Vulnerability Assessment:** Vulnerability from external probes and attacks.
- **Internal Vulnerability Assessment:** Vulnerability from internal probes and attacks.
- **Physical Security:** Analysis of both Central Office and Capital Center Data Centers.

The findings showed areas of strength and areas of improvement. One area where we performed well was in the external vulnerability assessment. The firm analyzed our network and equipment from an external source and then tried to penetrate our network and gain unauthorized access to systems. Our practices and systems configuration prevented unauthorized access to our systems. An area of improvement for the organization is in the area of systems and security governance. We are examining our policies, agreements, and procedures to align with best practices in this area.

Enterprise Applications

Canvas

Working in collaboration with the Department of Teaching and Learning, the IT Department launched a Learning Management System (LMS) in Fall 2016. The LMS is an application providing teachers the ability to set up a virtual environment for their courses. This virtual classroom environment allows students to access course materials, collaboration spaces, assignments and assessments anytime and from any place. Teachers can also collaborate in the LMS with colleagues from Beaverton as well as accessing resources from other teachers around the world. In addition to providing a digital platform for teacher collaboration and student learning, the LMS provides students with an experience they will encounter as they transition to higher education institutions or into other future paths, as most work professional development is delivered through an online environment.

While teachers and students have just started using Canvas, the implementation has been received positively by teachers and students.

Navigating how students and parents receive feedback on student performance is complicated by having both a student information system and a learning management system. Fortunately, the Beaverton School District can learn from other districts nationally who have designed solutions. A team from Teaching and Learning and IT is working on this project together.

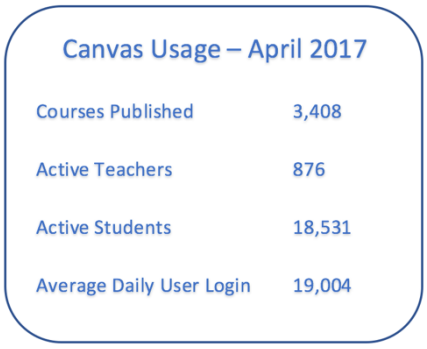

Figure 2: Canvas Usage 2016-17

SchoolMessenger Mass Notification System

SchoolMessenger continues to be heavily utilized by schools and the District to efficiently communicate with students, staff, parents, and other stakeholder groups. The SchoolMessenger system was a critical communications application during inclement weather in January, sending out 968,974 emergency notifications to families and staff. In almost every category, there was at least a 100% increase in messages delivered to students, staff, parents, and community members over the prior year.

Month	Emergency	Attendance	School Announcements	BSD Briefs	Nutrition Services	Classroom Messaging	Total Messages
September	182	65,177	820,705	305,643	27,882	5,175	**1,224,684**
October	186	79,290	1,043,175	389,769	35,132	8,686	**1,556,238**
November	4,334	76,546	752,552	236,186	34,553	10,792	**1,114,963**
December	647,684	48,556	735,282	236,326	21,408	5,564	**1,694,820**
January	968,974	39,056	1,059,725	394,057	11,376	3,600	**2,476,788**
February	99,722	75,009	1,024,291	486,661	19,861	5,631	**1,711,175**
March	1,487	101,809	823,554	236,897	31,158	10,385	**1,205,290**

Table 1: Total Messages Delivered by Month

Online Registration System

An exciting project in development this winter is the creation of an online registration system. This system will replace the paper enrollment and enrollment verification forms and will allow parents and guardians to electronically fill out those forms. For parents and guardians without the ability to fill out registration forms online, the paper versions will still be available. An electronic application will be much more convenient for parents and guardians. Reducing paper forms will also save school personnel hundreds of hours of data entry each fall. Currently, school staff enter form data manually for all student enrollment and enrollment verification changes, which is a very time-consuming process for school staff. IT is working with the vendor on the programming and workflow of this enhancement with an anticipated release to occur over the summer.

User Experience Improvements

There are a number of factors that together, form a user experience for staff and students. This user experience contributes to staff and students reporting adequate access to technology. Below are changes made this past year to improve user experience for staff and students.

Access to Adequate Computing Devices

Almost three quarters of computers used in the District are less than 5 years old. The amount of computer memory, storage, and processing power of these machines are able to provide students and staff with a satisfactory user experience. District-wide, the number of machines aged over 8 years has risen slightly from the 2,312 reported to the board last year.

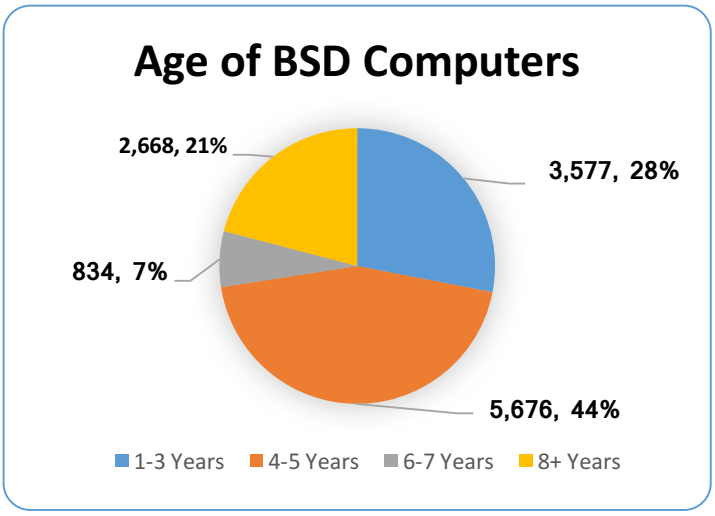

Figure 3: Age of BSD Computers

Teacher laptops were replaced in the summer of 2016. The old teacher laptops were given upgrades to memory and the hard drives were replaced with solid state drives, resulting in significant performance increases of the machines. The upgraded laptops were returned to schools for student use.

The most significant computer growth is in the number of mobile computing devices (iPads and Chromebooks), purchased over the past year. These devices were largely purchased for the FutureReady deployments. The number of iPads District-wide has grown from 3,254 in April 2015 to 16,432 in April of 2017, with an increase of 4,879 occurring over the past year. The number of Chromebooks used in schools has increased from 14,444 to 35,795 over the past year.

Added together, the number of mobile computing devices now drastically surpasses desktop and laptop computers used throughout the District. Through the work of the FutureReady initiative, the District has transitioned to mobile devices as the primary method of internet access to support student learning.

Customer Service Focus

The BSD IT department encompasses almost 80 staff members serving in schools and centrally. Realizing the core value of providing the best customer service, the IT Department spent focused time in small groups and as a department over this past year to define and agree upon a standard of service. Our department standard focuses on how we will interact with our

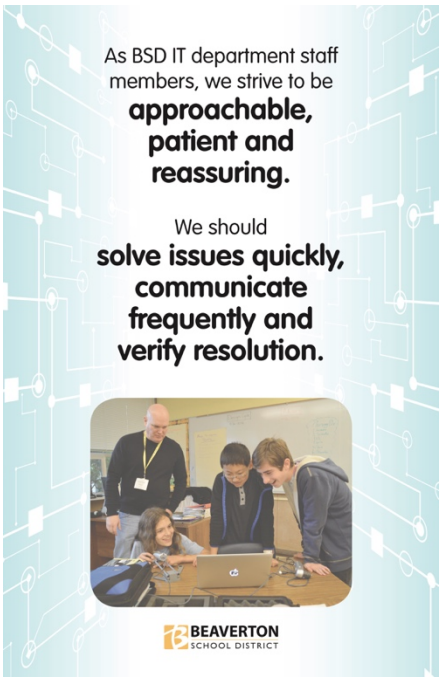

Image 1: IT Department Standard of Service

customers and also how we will agree on communicating and resolving technology issues. As we agreed on our standard of service, staff wanted to share our standard with our customers. Posters were created to share our standard and are posted in IT and schools to increase awareness of our customer-focused orientation.

Redesigned Help Desk

Another positive outcome of our department professional development and focus upon customer service this year was the redesign of our Help Desk system. When BSD staff have technology issues, they have staff in the building for support, or they can contact the Help Desk line if it is urgent. For other matters, we have a Help Desk ticketing system, which is standard practice in information technology departments. The purpose of the Help Desk ticketing system is for staff to quickly enter technology issues and have them routed to the appropriate IT staff for resolution. Finally, the Help Desk system allows us to measure our responsiveness in terms of speed of resolution, professionalism of our staff when responding, and providing staff the ability to rate their satisfaction with our service.

IT staff evaluated our current Help Desk ticketing system and along with staff feedback, realized it was not the most intuitive interface for staff. A team was tasked with researching and designing a new interface from the customer's point of view. The new interface had to be intuitive for the user, allowing issue entry with as few clicks as possible. On the back-end, we completely redesigned the routing interface, meaning that tickets now most quickly get to the staff member who can resolve the problem. Finally, we implemented the ability for staff members to leave feedback on the speed and quality of the service provided.

The new system was released in February and since the release, we have experienced more staff using the system for routine issues and requests. Staff also have left positive reviews on the service they have received from IT.

FutureReady Year 3 Support

Working in partnership with Teaching and Learning, the IT Department deployed over 26,230 student devices this school year to support the FutureReady initiative. This successful distribution of student devices involved staff from schools and many central office volunteers, in addition to numerous community members and business partners. Our infrastructure is stable and as a result, we were able to purchase devices in January that were originally projected to be deployed for the 2017-18 school year. We are ahead of schedule with device deployments and the devices in the system are holding up well with minimal breakage or loss.

As a result, we will use the 2017-18 school year as an evaluation year prior to selecting the replacement of student technology for the remainder of the bond.

Image 2: Vose students learning coding concepts

In Fall 2016, students at high schools and some middle schools were given a Chromebook as a student technology device. This device was checked out to the student and designed for use with Canvas and school work both at school and at home. We engaged with a vendor to provide filtering on the devices when the devices were not at schools. There were issues with the filter that took weeks to resolve, but fortunately, the vendor has addressed issues relative to the off-campus filtering of student devices.

Digital Equity

The combination of learning management system, curriculum and pedagogy shifts, and the student devices is changing the way that students learn and demonstrate understanding. While this is an exciting improvement for many students and teachers, the Beaverton School District, like many other districts around the country, is working through the reality that not all students have internet access at home to support learning after the school day. For some students, this reality means they must seek out internet access around the city to be able to finish homework and continue their learning. We have formed a digital equity group with building and departmental expertise to increase awareness and research solutions. The group is developing a multi-faceted approach to improving and resolving this equity issue affecting our students.

Looking Forward

We are busy preparing for Fall 2017 at this time. When school begins next year, parents and guardians will have an electronic student registration process, providing ease of use for enrolling students and also saving staff data-entry time at all schools. The network and server infrastructure of our new data center will be in-process and along with our Dark Fiber project, will be designed to scale ahead of need. Our infrastructure, enterprise applications, and technology support staff are aligned and able to continue our digital transformation of teaching and learning.