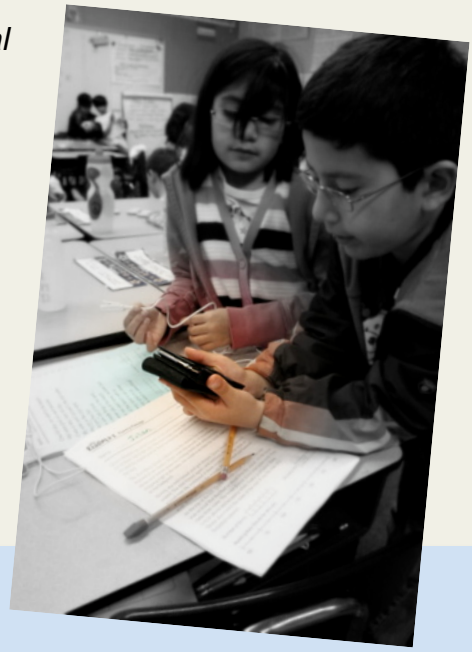
Beaverton School District

Technology Plan

Our mission:

To engage our students in rigorous and joyful learning experiences that meet their individual needs so they may thrive, contribute, compete, and excel.



2011-2014

Beaverton SCHOOL DISTRICT

creating pathways to the future for all students

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I. BACKGROUND

The mission of the Beaverton School District is to engage our students in rigorous and joyful learning experiences that meet their individual needs so they may thrive, contribute, and excel. The *Technology Plan 2011 – 2014* provides the framework, guidelines, and the plan for harnessing technology to support the achievement of the Beaverton School District Mission.

The purpose of the *Technology Plan 2011 – 2014* is to create and articulate a strategic technology vision with a focus on improving student learning through appropriate instructional and administrative uses of technology tools.

Beaverton School District Goal

All students will show continuous progress toward their personal learning goals, developed in collaboration with teachers and parents, and will be prepared for post-secondary education and career success.

Beaverton School District Strategic Plan 2010 – 2015

In 2009, the School Board created and approved the Beaverton School District Strategic Plan for 2010 – 2015. The vision of the Strategic Plan outlines these beliefs:

- We fundamentally believe that every single child has unique gifts and talents, and we are committed to help discover and develop them.
- Success belongs to each student and will not be predicted by race, ethnicity, family economics, mobility, gender, disability, or initial proficiencies.
- All children will have choices for their future success and will carry with them a life-long love of learning that enhances their lives and supports generations that follow.
- High standards and high expectations drive our students, our staff, and our community.
- Every staff member commits to professional growth, excellence, and success.
- We are strongly connected to our families and the local and global communities.

The following core strategies emerged from the vision of the Strategic Plan:

T	**Technology:** Employ 21st century technology to support innovation and excellence.
H	**High Quality Empowered Teaching Staff:** Hire, develop and retain qualified, committed and diverse staff throughout the District.
R	**Respect for Human and Environmental Rights:** Ensure a safe, caring and sustainable learning environment for students and staff.
I	**Individual Student Growth:** Strengthen student learning experiences through teacher collaboration, student proficiency, differentiation and common assessment.
V	**Volunteerism, Service, Engagement:** Directly connect parents and the community to student learning and students to community life.
E	**Equity in Student Outcomes:** Develop a customized learning plan for every student that is relevant, current and challenging.
S	**Scorecards for System-wide Accountability:** Regularly review and improve the strategic plan and the implementation details that support it.

Vision of the Technology Plan 2011 – 2014

At this time, understanding and use of technology tools are integral parts of virtually all aspects of daily life. It is the Beaverton School District's responsibility to prepare students for this reality. In support of the Strategic Plan and District Goal, technology will be integrated in a manner that furthers a learning community where:

- All students actively engage in relevant, rigorous learning experiences that provide immediate feedback for growth. They must have equitable access to appropriate technologies to meet their learning needs. Students actively participate in setting and attaining their educational goals.

- Students, staff, parents and community members are fully engaged and connected to student learning through a seamless technology system that provides real time communication and collaboration.

- All teachers use technology to support learning across the curriculum. Through on-going professional development, all teachers acquire the knowledge and skills to integrate technology into challenging curriculum that addresses the specific needs, developmental levels, and learning styles of their students.

- All staff use technology to more effectively accomplish their responsibilities. Professional development is provided to all staff to enhance their knowledge and skills.

- Administrative and operational efficiencies are realized as technology systems are employed to support all schools and departments throughout the organization. Technology resources are maximized and leveraged to streamline processes, increase staff productivity, and facilitate access to information.

Our 21st century vision is filled with educational experiences that:
• maximize every student's potential for learning
• prepare every student with the knowledge and skills to succeed in college and career
• launch every student into the world with the ability to pursue his or her dreams.

Our vision of a 21st century classroom is a bit noisy, interactive, and occasionally messy. Walking into a classroom, you will see small groups of students clustered around an interactive whiteboard creating a collaborative word problem using PowerPoint, students compiling a wiki glossary of math terms to share with their peers, and other students working together to create their own web pages. In a quiet corner of the room, you may see individual students reflecting on their day's activities in their own e-journal or reading the blog created by their teacher who is on maternity leave. Using an iPod Touch to record his voice, a student reads from a passage so the teacher can play it back later and assess fluency progress.

Using interactive response technology (clickers), teachers quickly assess whether students understand the concept just presented. Out in the hall, a student news team, consisting of a director, camera-person and reporters, is filming a public service podcast depicting the amount of energy saved by turning the lights off when leaving a room. A small group of students, working with an ELL specialist, is creating a bilingual video tour of their school for new students to share with their parents. Excitement abounds as students use Google Earth to locate a bird's eye view of their homes, calculating the distance to their school.

The walls of the classroom expand as students venture outside with digital cameras to capture angles and symmetry in nature and on the playground. Armed with probes and netbooks, high school students monitor a local creek downstream from a manufacturing facility and share their results with scientists at Oregon State University via video conferencing. Students in each high school learning Mandarin Chinese share a virtual classroom led by a native Chinese instructor living in Beijing. Two classrooms across the district become one learning environment as students share their Venn diagrams of extinct animals, comparing habitat, nutrition, and predation.

II. TECHNOLOGY OVERVIEW

Technology in the Beaverton School District is an important tool supporting student engagement, learning, and achievement. The last several years have been a time of infrastructure development to support this core mission. Network infrastructure has been redesigned and implemented, some progress with respect to replacement of aging computers was made, and a data warehouse was created to give staff access to data critical to decision making. Additionally, desktop management tools have been deployed that allow for asset tracking and management, remote management, and the ability of IT staff to resolve technology issues much more quickly than in the past. Key initiatives realized from the *2007 – 2010 Technology Plan* include:

- Technology Standards adopted for Kindergarten through 8th grade
- Standardized application suite implemented for students and staff
- Increased access to technology training for students and staff
- Implementation of a Directory Services architecture providing individual staff and student logins
- 1 Gigabit (GbE) connectivity to all school sites, supporting increasing demand for streaming media and network demands from more sophisticated desktop management tools
- Desktop and asset management tools providing faster equipment issue resolution
- Centralized security solution resulting in increased security on all district computers

Beaverton School District Technology Current State:

Connectivity

The Beaverton School District has in place a high speed, large scale Local Area Network (LAN) that connects all campuses and ancillary sites to the central Data Center located in the Administration building. The Data Center houses much of the equipment responsible for internet connectivity, network-based services, servers, and storage equipment used throughout the District. Additionally, the Administration building houses the District's telephone and voicemail systems.

School and departmental sites are equipped for connectivity to centralized systems. Each location has data and telephone switches that connect to the fiber optic physical layer of the network. Classroom and other spaces are wired to support telephone and 100/1000 baseT Ethernet.

While wireless technology is deployed in all schools and ancillary sites throughout the District (using 802.11b (11 Mbps) access points), there is great variance in the portion of the school or site that has access to the wireless network. The wireless network does not use Enterprise Access Points (APs) and as such, lacks sophisticated security and management features.

Client Computer Hardware

The most recent computer inventory analysis report identifies almost 16,000 client computers in use throughout the District. These computers are a mixture of Apple Macintosh computers and computers running the Microsoft Windows operating system. There are still some client computers that need to be integrated into the asset management system, so the actual number of client computers will grow as this work is finished.

Of the 15,706 computers identified, 44% of these computers are 5 years old or older. Eighteen percent of client computers in the District are 8 years old or older. Budget reductions over the past few years reduced, and then eliminated the ability to centrally purchase replacement equipment. The age of our client computer fleet is a serious concern and is an obstacle to teachers and students who rely on the equipment for learning, teaching, and assessment.

Client Computer Software

The Beaverton School District standardized on the Microsoft Office suite of applications in 2008. At the same time, Sophos Antivirus was installed on all District computers to provide antivirus and malware security.

As part of the standard computer image, students and staff have access to a suite of both open-source and commercial software applications. As more textbook adoptions contain digital resources, those applications are added to the standard District computer image. Schools also have the flexibility to purchase software relevant to their site-specific instructional needs.

Staff Professional Development

Professional development offerings during the past three years have been focused on three areas – integration of technology into the classroom, strengthening of staff basic skill sets, and training around the deployment of the Office suite for all students and staff. Strong support for all three purposes is indicated in the number and types of courses that were offered.

In the area of integration into the classroom, there were two strategic foci. The first was the offering of technology tools (digital still cameras and musical keyboards) to teachers for use in their classrooms after completing a 4 session course after school to learn how to use the new tool and explore ideas for using

images in the classroom. Every class offered had many more teachers interested than spots available. The Using Digital Images class was offered 7 times, training 138 teachers and providing 138 cameras in district classrooms. The other integration strategy was the annual Summer Tech Camp. This program is coordinated regionally, offering teachers the opportunity to voluntarily spend 12 hours over four days deeply engaged in new ways to integrate technology with content. In the summer of 2010, there were 8 course offerings with almost 100 participants.

Training after the school day is also offered to all staff members with a focus around specific applications (iPhoto, FirstClass, our CMS system, and many others). These offerings provide staff the opportunity to quickly learn new skills directly related to their work.

The third focus was the implementation of Microsoft Office as our new productivity suite. IT staff provided support and training for staff throughout the transition process through course offerings and the creation of training materials and support documentation.

Due to budget constraints and IT staff reductions, the number of courses offered in the last two years has been reduced, significantly impacting the ability to provide training and support to both certified and classified staff. At present, the number of course offerings available to staff has been reduced by 50%.

Project Infusion (ARRA Title IID Technology Grant)

As a result of an ARRA Title IID technology grant awarded in January 2010, seven classrooms (grades three through five) at two elementary schools were equipped with laptop computers, interactive whiteboards, document cameras, handheld devices, response systems, digital cameras plus the support of a qualified technology coach and targeted professional development.

While the core content area of math is the primary target, the expectation is that all areas of the curriculum will be supported and enhanced by this infusion of digital instructional tools. Examination of individual and cohort student data both in math and technology literacy skills will quantify success of the Project Infusion grant. Preliminary results are extremely positive and the dynamics of instruction in these classrooms has shifted significantly in just the first eight months of this project with the teachers declaring they cannot imagine how they would teach if the technology were to be removed from their classrooms. Moving forward, one critical factor will be the replication of these 21st Century classrooms throughout the Beaverton School District.

Research and Data Reporting

The District conducts research and data analysis for both internal data-driven decision-making and for reporting at State and Federal levels. Research and data analysis is used for administrative planning and

to assist with program evaluation. The District provides Data Warehouse access to all administrative and most certified staff. Currently, the Data Warehouse contains information from the student information system, and in the future will also integrate information from the District Enterprise Resource Planning (ERP) system.

Enterprise Systems

The District's student information system is a product called eSIS. eSIS is a java-based, cross-platform application used by District personnel for student records, teacher classroom reporting, and for creating data reports and extracts for District, State, and Federal reporting requirements. The Beaverton School District has been a long-standing participant in the Oregon eSIS Consortium, which provides substantial cost savings for development, State reporting changes, and product enhancements.

In November of 2010, the eSIS product was purchased by Pearson. An evaluation of the Pearson student information system is underway. It is certain that the District will be moving from the eSIS product in the near future with recommendations moving forward during Spring 2011.

The library system used by all District schools is an application named Horizon. The Horizon system provides students and staff with 24/7 access to a true union catalog of the print and electronic collections at each school. The total volumes of print materials in the District are nearly 1.5 million with a value of over $43.5 million. Annually, libraries throughout the District process over 1.39 million transactions.

The enterprise messaging application used by all District personnel is FirstClass. This application provides email, calendaring and contact management functions for all staff. FirstClass also provides a solution for teacher web pages. Due to limited features, calendar and mobile device support, some building staff are utilizing third-party web tools for calendaring, teacher web pages, and contact management.

The Integrated Financial Administrative Solution (IFAS) product is the District's Enterprise Resource Planning solution. Staff from Business Office, HR, and IT completed a major systems upgrade to the system in the Summer of 2010 that both updated the core software of the system and changed the database architecture of IFAS, providing more powerful tools and ways to access data.

III. 2011 – 2014 THEMES, GOALS, AND RECOMMENDATIONS

THEMES

As the Technology Planning Project Team began the visioning process, four distinct, yet inter-related themes emerged. The themes from the Technology Planning Project Team are:

- Teaching and Learning Environment
- Communication, Collaboration, and Community
- Equity
- Infrastructure Improvements

> Our leadership in the world depends on educating a generation of young people who know how to use technology to learn both formally and informally…
>
> - *Transforming American Education: Learning Powered by Technology*

These themes provide alignment to both the Oregon Department of Education Technology Plan and the National Education Technology Plan 2010.

Key initiatives from the Oregon Department of Education Technology Plan address the need for the integration of technology into curriculum and instruction, engaging parents, community groups, business partners and higher educational institutions to promote increased access, communication and collaboration, and develop systems that increase collaboration and productivity.

The recently released National Education Technology Plan presents a model of learning with goals and recommendations in five essential areas: learning, assessment, teaching, infrastructure, and productivity. The plan also recognizes the importance of research and development (R&D) in seeking new applications for technology to support the learning environment and business processes of the organization. A very important theme in the National Education Technology Plan is to create a model of connected teaching. In this student-centered model, teams of teachers replace solo practitioners, classrooms are fully connected with the proper tools, and students use technology for engaging, relevant, and personalized learning experiences. Students are at the center of their learning.

Theme 1: Teaching and Learning Environment

> …Technology is increasingly a means for empowering students, a method for communication and socializing, and a ubiquitous, transparent part of their lives…
>
> - 2010 *Horizon Report: K-12 Edition*

The instructional core is defined as the relationship between the teacher, the student, and the content (City, Elmore, Fiarman, and Teitel 2009). Technology supports the instructional core by providing ways to differentiate learning, allowing students and teachers to interact with content in new ways, expanding access to information from just printed materials in the classroom to materials and information from anywhere in the world, updated continuously, and in a variety of formats.

The objectives below are those initiatives that we feel will make the most impact in the next three years supporting a student-centered, personalized, and connected teaching model.

Teaching and Learning Environment Objectives

Objective 1: Develop and implement technologies designed to improve individualized student learning.

Electronic Plan & Profile

During the next three years, BSD will implement a personalized web portal for each student that will allow students, in collaboration with their teachers and parents, to create and maintain their educational goals. In addition to educational goal setting, the Plan & Profile application will provide student progress information, integrating assessment and achievement data from the student information system, the data warehouse, and other data sources. Together, the planning tool and the student progress and profile tool will be a valuable application supporting and informing student academic success.

Online Education

Online learning is one of the fastest growing trends in educational technology. The National Center for Education Statistics (2008) estimated that the number of K-12 public school students enrolling in a technology-based distance education course grew by 65 percent in the two years from 2002-03 to 2004-05. More recently, Picciano and Seaman (2009) estimated that more than one million K– 12 students took online courses in school year 2007–08. Online education allows student learning to be extended past the confines of the school day and classroom, expanding educational opportunities to anytime and anywhere. The Beaverton School District is fortunate to be a partner in the Oregon Virtual Education Center (ORVED) and in addition, will research, develop and implement other models that blend online and face-to-face instruction.

Technology Research, Development & Innovation

The National Education Technology Plan calls for a new approach to Research and Development, one that learns from other sectors and critically evaluates technology to maximize the investment. Currently, the Beaverton School District allocates just over $36,000 per year to researching, testing and evaluating new and emerging technologies. This level of funding is not sufficient to determine technology tools best suited to the District. Increasing research and development funding will result in standardized, targeted and focused technology tools procurement in the future, translating to easier and more informed purchasing at school sites.

Activities	**Description**	**Funding & Source(s)** Existing Additional	**Strategic Plan Alignment**	**Evaluation Measures**
Electronic Plan & Profile	The Electronic Plan & Profile will be a web application integrating student planning information with achievement data so that students, parents and teachers will be able to chart their course to academic success.	NWRESD Resolution monies $300,000 (2010 – 2011) $200,000 / yr (2012 – 2014)	**I**ndividual Student Growth, **E**quity in Student Outcomes	Use metrics to yield number and percentage of plans revised at least annually
Online Education	Beaverton School District will participate in the Oregon Virtual Education Center (ORVED). BSD will also develop, pilot, and implement online and hybrid models for delivery of instruction.	NWRESD Resolution Monies $50,000 (2010 – 2012) TBD (Dependent upon use) (2012 – 2014)	**I**ndividual Student Growth, **E**quity in Student Outcomes	Student participation metrics
Technology Research, Development & Innovation	New hardware and software technologies are researched, tested, piloted, and evaluated for instructional impact.	General Fund $36,201 (2009 – 2010) Additional $113,799 ($3.89/student)	**I**ndividual Student Growth, **E**quity in Student Outcomes	Proof of Concept studies Best practice white papers

Objective 2: Provide teachers with the knowledge and skills to integrate technology into instruction.

Instructional Technology Specialists Model

If technology is to be used by teachers to maximum effectiveness, then an important facet of teacher support is a professional educator who can work with teachers on leveraging technology for improving their practice. Studies have found that educators are more likely to incorporate technology into their instruction when they have access to a professional educator who can engage with them around employing technology in their practice (Strudler and Hearrington 2009). Within the District, recent teacher growth in using technology for instruction at both Kinnaman and Terra Linda has been directly attributed to a certified staff member, housed on-site, and specifically tasked with working with teachers to integrate technology into their teaching.

TeacherSource Development

TeacherSource is a teacher web portal that provides lesson plans, prompts, assessments, videos, and other resources created and shared by Beaverton School District teachers. In the short time since launch, TeacherSource has become an important tool connecting teachers to each other and to quality content.

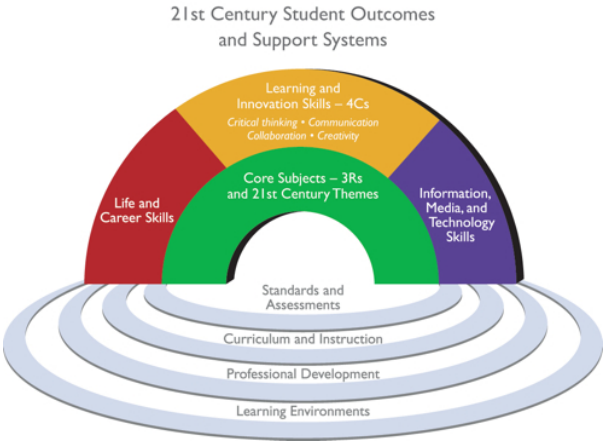
Technology Professional Development Opportunities

TeacherSource is a great example of professional development for teachers that is forward thinking, flexible, and allows for just-in-time learning and resource sharing. Existing technology professional development is not adequate for teachers, and more resources are needed to create a diverse offering of professional development that provide both online and face-to-face opportunities for teachers to learn new and emerging technologies and provide teachers with support in using technology tools tied to core content standards.

Activities	**Description**	**Funding & Source(s)** Existing Additional	**Strategic Plan Alignment**	**Evaluation Measures**
Instructional Technology Specialists Model	Site-based, licensed staff providing support for integrating technology into the learning environment. Staff would provide modeling, coaching, and support in developing lesson plans that use technology tools supporting standards. They would also provide support for technology standards integration into the curriculum.	Local Option $1,540,000 / yr	**H**igh Quality Powered Teaching Staff **I**ndividual Student Growth	Teachers report having tools and resources needed to differentiate instruction
TeacherSource Development	Continued development of the TeacherSource application.	General Fund $300,000 / yr	**H**igh Quality Powered Teaching Staff	Staff site access metrics Staff Professional Development activities
Technology Professional Development	Existing Professional development opportunities for staff will be expanded to cover new and emerging technologies and integration into the teaching and learning environment. To meet the diverse learning needs of teachers, Professional development will be in a variety of formats. Professional development will cover technology integration supporting core content standards.	General Fund $28,000 $50,000 (2011 – 2014)	**H**igh Quality Powered Teaching Staff	Course offering lists Class rosters Course Evaluations

Theme 2: Communication, Collaboration, and Community

We live in a world where learning is everywhere, anywhere and at any time. Learning is no longer limited to a specific location, time of day or to a particular device. According to the *Partnership for 21st Century Skills* (http://www.p21.org), "students must also learn the essentials skills for success in today's world, such as critical thinking, problem solving, communication and collaboration." As effective communicators in a diverse world, students must be able to utilize multiple technologies, evaluate their effectiveness and assess their impact. As effective collaborators, students must be able to work with others respectfully and flexibly while assuming shared responsibility for group work. Teachers and staff must be proficient in and able to model these skills.



Framework for 21st Century Learning from Partnership for 21st Century Skills

Student learning is a collaborative process that includes teachers, parents, business leaders, and the community. All stakeholder groups support and have an interest in student learning. The manner in which people search, find, and consume information has dramatically changed with new internet applications. To effectively communicate with all our stakeholders, we must research, develop, and implement increased efficiencies in how the Beaverton School District as an organization communicates both internally and with our community.

Communication, Collaboration, and Community Objectives

Objective 1: Create and employ applications designed to connect students, teachers, parents, and community members resulting in improved communication between all parties.

Web Site Redesign

One important communication resource for both staff and the community is through internal and external web sites. The internal web site (intranet) provides staff with access to information, forms, and documents relevant to their work. The community consumes information regarding District activities, School Board meetings, and the budget process through the external web site. Both internal and external web sites are in need of a redesign. The outcome of the redesign will be web sites that are aesthetically pleasing and have a user interface that allows users to quickly, efficiently, and intuitively find the information they seek.

School and Teacher Web Tools

The Project Team noted that there is inconsistency with regard to school web site implementation. One reason for this inconsistency is due to staff constraints. Another reason lies with the application (called a content management system, or CMS) used by schools to create and update their school web sites. The result is confusion for both staff in managing school web sites, and students, parents, and community members in finding information. The current CMS was developed internally, which at the time was the best solution given financial and other constraints. As part of the internal and external web site design, it is important that we identify and implement a CMS that is very easy for staff to use to update school web sites.

The existing district application for teachers to use to create teacher web sites also suffers from a difficult user interface. Teachers who are inexperienced with web site creation find the experience confusing, and teachers who are very comfortable with creating web sites complain that many sophisticated features they need are insufficient or non-existent. This situation has led to many teachers using a vast number of free and paid web site tools, which makes it more difficult for parents and students to find information. We need to find a solution that is both very simple for teachers to use, and yet offers a sophisticated set of tools for those teachers who need that functionality.

Improved Student Collaboration Tools

The Beaverton School District currently provides student email accounts and a file storage solution for students to store electronic copies of their files. Both the email system and the student storage systems are outdated, suffer from compatibility with newer operating systems, and are in need of replacement. One growing trend in both higher education and K-12 education is the use of "cloud" based email and file storage for students. Cloud services utilize a third party vendor such as Google or Microsoft to provide student email, calendaring, and file storage that would be hosted by the vendor, often at little or no cost. Moving student email and storage to the "cloud" would yield the double benefit of providing students with improved collaboration tools at little cost to the District.

Activities	**Description**	**Funding & Source(s)** Existing Additional	**Strategic Plan Alignment**	**Evaluation Measures**
Redesign Beaverton School District external and internal web sites for improved ease of access for students, staff, parents, and community members	External and internal BSD web sites need of navigation, user interface and search upgrades.	$100,000 (2011 – 2012) $15,000 (2012 – 2014)	**V**olunteerism, Service, Engagement	Site use metrics Parent, staff and student survey data
Increase school site and teacher web use through improved applications and training opportunities	Provide a Content Management System (CMS) that will simplify schools site and teacher web site updates.	CMS funded as part of Redesign of Web sites. IT staff will increase web training opportunities for staff	**H**igh Quality Powered Teaching Staff **V**olunteerism, Service, Engagement	School site and staff use metrics
Improved student collaboration tools	Student email and storage need capability and capacity upgrades.	General Fund	**I**ndividual Student Growth **E**quity in Student Outcomes	Student use metrics

Objective 2: Create and employ applications designed to increase collaborative learning by extending the learning environment past the physical school day and classroom space.

Social Media Toolkit

Social media, often referred to as web 2.0 tools, allow for communication and collaboration between students, teachers, and other professionals around the world. Blogs, wikis, and nings are some examples of social media tools that provide students with the ability to share their work with other students and teachers. As social media tools are increasingly used in K-12 education, it is important that students and teachers have resources and access that promote best practice use and compliance with the Children's Internet Protection Act (CIPA) and the Children's Online Privacy Protection Act (COPPA). A web-based toolkit needs to be developed to provide students and staff with guidance on how to best integrate social media tools into instruction.

Learning Management System

A Learning Management System (LMS) is a software application used to provide content, deliver assessments, and allow for student and teacher exchange of documents and communication. The District lacks a LMS and as a result, many teachers are using a variety of free and for-profit applications.

Providing a centralized LMS would provide a workspace for student and teacher communication, allow for content to be accessed, and assessments to be delivered and scored. A learning management solution would integrate with the student information system, the plan and profile application, the online education initiative, and allow students who move between schools to have a consistent experience. Learning management system use is common in higher education, so providing the experience for our high school students will better prepare them for what they will likely experience at higher educational institutions.

Activities	**Description**	**Funding & Source(s)** Existing Additional	**Strategic Plan Alignment**	**Evaluation Measures**
Develop a social media toolkit for the appropriate use of social media tools to be used by both teachers and students	As social media tools and applications are more widely adopted into the teaching and learning environment, teachers and students need support and guidance on how to best utilize web 2.0 tools.	General Fund	**H**igh Quality Powered Teaching Staff **I**ndividual Student Growth	Teacher site access Teachers reporting on use of web 2.0 tools in instruction
Acquire Learning Management System (LMS) to increase student and teacher collaboration and provide online and hybrid learning opportunities	An LMS is the platform that would support online learning opportunities, allow for assessments, and also provide students and teachers with an environment in which to collaborate.	Costs dependent upon whether open source or commercial product selected	**H**igh Quality Powered Teaching Staff **I**ndividual Student Growth	Number of students and teachers using LMS

Theme 3: Equity in Access

"In the 21st century, students must be fully engaged. This requires the use of technology tools and resources, involvement with interesting and relevant projects, and learning environments—including online environments—that are supportive and safe."
— Arne Duncan, U.S. Secretary of Education March 3, 2010

It is essential the District ensure equity of access to technology resources that enable and empower all learners and staff members. Access to technology must be provided in an equitable manner throughout the District. Currently, the District does not have a comprehensive technology replacement plan for computers and peripheral devices, resulting in varied and inequitable access between schools.

Equity in Access Objective

Objective 1: Create and support an adequate and equitable standard of technology in classrooms, schools and support services so that students and staff have the same access to essential technology tools.

21st Century Classrooms

There is great variance with regard to technology deployment at schools across the District. For example, there are schools where every classroom has a projector, laptop, speakers and cart and other schools where this type of technology access is very scarce. An important part of achieving an equitable and consistent technology experience for students and staff is the standardization of a technology baseline to support instruction. This baseline would provide a laptop computer, document camera, cart, ceiling-mounted projector and speakers to allow teachers to use web tools and applications, provide for student sharing and demonstration of work, and allow for viewing and interaction with multimedia tools. The baseline 21st Century classroom would ensure students and staff with a consistent technology experience, and be flexible enough to adapt to teachers and/or courses that would require additional technology tools.

Site Based Computer Support Staff

Across the District, there are many schools that lack a support person to ensure technology hardware and software remains functional. Some of the secondary schools have a dedicated classified Computer Support Technician staff member in this role, other schools rely on only what support can be provided centrally by a unit 6 field technicians and 3 hardware repair technicians. A model of support that would ensure equitable access to technology for students and staff demands that a support structure be defined to address the day-to-day support technology needs. A CoSN study revealed that nationally, the number of computers per computer technician in K-12 education is estimated at 612:1 compared with 150:1 computers per technician in private industry (CoSN 2009). Even including the Computer Support

Technicians at the secondary schools, the ratio of computers to computer support staff at BSD is over 1,200 computers per computer technician. Improvements in desktop management over the past few years have allowed us to become more efficient in resolving computer issues, but we are at a point where the support structure is not adequate, nor equitable with regard to ensuring functional technology equipment to support instructional needs.

After School Community Access

Recent changes to eRate funding now allow for school computer labs to be available to the community. Providing lab access past the school day would increase access for students, and could allow for parents or volunteers to better support students by having access to technology tools and the internet. A model needs to be developed to expand access while maintaining the equipment.

Activities	**Description**	**Funding & Source(s)** Existing Additional	**Strategic Plan Alignment**	**Evaluation Measures**
21st Century Classrooms	Provide a core, common, and flexible set of classroom technologies in every classroom in the District to include teacher computer, document camera, cart, ceiling-mounted projector and speakers. The 21st Century Classroom would be a School and District standard.	Local Option $ 2,100,000 / yr	**E**quity in Student Outcomes	Number of classrooms finished
Site-Based Computer Support Staff	Computer Support staff would be classified staff working at each school to deliver Tier 1 technology support. This position would provide troubleshooting equipment and software issues would allow teachers to focus on the work of teaching.	Local Option $1,200,000 / yr	**H**igh Quality Powered Teaching Staff **I**ndividual Student Growth	Help Desk metrics
After School Community Access	School computer labs could be available after the school day to allow students and parents access.	General Fund *Could require extra funding for staff extended pay*	**E**quity in Student Outcomes	Lab usage statistics

Objective 2: Implement a comprehensive replacement schedule for all technology tools to ensure students and staff have equitable access to ensure high student achievement and efficient, effective work environments.

5-Year Computer Replacement Cycle

As mentioned earlier, 18% of computers District-wide are 8 years or older and 44% of computers are 5 years or older. In addition to their use in teaching and student learning, District computers are used regularly for State assessments, and increasingly, for local formative assessments. Central monies allocated for computer replacement have been reduced over the past few years due to budget constraints. During the 2009-2010 school year, there were no monies allocated centrally for computer replacement. This gap in computer replacement not only impacted the schools during the 2009-2010 school year, but also will continue to impact the schools in the future. The result of the absence of a structured plan for equipment replacement is that computer replacement largely falls to building administrators, resulting in vast differences in age distribution of computers throughout the District. An immediate need is to establish a replacement cycle for computers to both remove the oldest, barely or non-functional machines from our inventory, and also to address the recent inability to purchase machines over the past year.

Looking forward, there are a number of promising technology trends that could reduce our reliance on computer workstations. Tablet computers, netbooks, mobile devices, and the ability of students to bring in their own devices could lead to less reliance on computer desktops and laptops. There is still an immediate need though, to replace thousands of the oldest computers throughout the District, and a system needs to be developed that provides both an equitable baseline of computer workstation technology and removes the burden of finding computer replacement monies from the building administrator.

Activities	**Description**	**Funding & Source(s)** Existing Additional	**Strategic Plan Alignment**	**Evaluation Measures**
Implement a 5-year computer workstation replacement cycle for all schools and departments	A 5-year refresh cycle, with a standard 4:1 student computer ratio would provide an equitable baseline for computer use.	Local Option $ 2,000,000 / yr (Student) $ 1,000,000 / yr (Staff)	**I**ndividual Student Growth **E**quity in Student Outcomes	Computer inventory reports showing replacement cycle progress

Theme 4: Infrastructure

Infrastructure is the integration of technology hardware, software, data, networks, and human resources in ways that provide the availability, connections, and access to the global wealth of information resources and experiences to support student learning.

A critical component of delivering the vision of improved student learning and operational efficiencies is a robust infrastructure that provides students, teachers, and staff with the resources to support the learning environment that is safe, secure, and protects the privacy of our users. As such, infrastructure must be considered as the portfolio of technologies that enable and affect all other components of the technology plan.

Infrastructure serves not only the immediate classroom needs, but must be considered in the context of access to information, resources, and learning opportunities that extend beyond the physical classroom and school day, creating 24/7 learning opportunities for students, teachers and staff.

Infrastructure Objectives

Objective 1: Provide infrastructure to meet current and future demands, while strategically investing in those technologies that will most impact the teaching and learning environment.

Enterprise Wireless Network

Most of the initiatives mentioned in this plan will require a robust and secure network environment. The current wired network capacity is adequate at this time, and is expected to remain adequate for the near future. The existing wireless network is not adequate to meet the needs of students and staff and is run on hardware that was designed for home use, not an organization of the size and complexity of the Beaverton School District.

What is needed is an enterprise wireless network. This type of wireless network has security features that would allow guest access, facilitating the ability for students and staff to use personal communication devices as tools for learning while protecting the rest of the network and sensitive applications such as the student information system. An enterprise wireless network comes with sophisticated management tools, saving support staff travel time out to the school sites to resolve network issues.

Telecommunications System

A new telephone system must be purchased very soon. Components of the current telephone system are approaching 20 years in age, and the system is past end-of-support from the vendor. There are a number of schools where the telephone system is at full capacity, meaning that if a school needs an additional line, school staff must determine another telephone line to disconnect.

Activities	**Description**	**Funding & Source(s)** Existing Additional	**Strategic Plan Alignment**	**Evaluation Measures**
Enterprise Wireless Network	Current wireless network does not meet present needs and must be replaced if the teaching and learning environment moves to allow student and staff-owned technology devices.	e-Rate funding $400,000 (2010 – 2012) $200,000 / yr (2013 – 2014) $40,000 / yr (2014 -)	**H**igh Quality Empowered Teaching Staff **I**ndividual Student Growth	Connection metrics to show increased capability Staff and student ability to connect personal technology devices in support of teaching and learning
Telecommunications System	Current system components approaching 20 years. A new telecommunications system would integrate into messaging system, providing collaboration and safety benefits.	Facilities Grant & Bond $1,800,000 Additional Sources 4,000,000	**R**espect for Human and Environmental Rights	Number of systems replaced Post-implementation staff survey

Objective 2: Examine enterprise applications and re-engineer to create operational efficiencies through automation.

Integrated Financial and Administrative Solution (IFAS) Phase 3

IFAS is the Enterprise Resource Planning (ERP) application used by the district to manage assets, financial, and human resources. During the summer of 2010, a significant upgrade was made to the system and to the database architecture. This upgrade (Phase 2) allows a number of operational efficiencies to be achieved, both through automation and re-engineering business practices and rules. Phase 3 of the IFAS Project will focus on the automating and redesigning of practices and rules, resulting in increased operational efficiencies.

Replacement of Messaging System

The current messaging system used by staff for email, calendaring and contact management is no longer meeting the needs of our users. A messaging system is needed that will allow mobile device connectivity, greater storage capacity, and a more intuitive user interface. Replacement of a messaging system will begin with a needs assessment to determine user requirements. Commercial, open-source, and "cloud" solutions will be evaluated.

Replace Student Information System (eSIS)

The current student information system (SIS) was purchased by another vendor in November of 2010. The acquiring company has announced end-of-life for the eSIS product. The Beaverton School District, along with the Oregon eSIS Consortium, will be conducting an evaluation of student information systems with a target implementation of a new student information system in the 2012-2013 timeframe.

Replace District Library Management System

The District Library system provides 24/7 access to all staff and students, processes almost 1.4 million circulation transactions annually, and holds an inventory of 1.5 million volumes valued at $43,500,000. The library management system is over 7 years old and the vendor is no longer providing product enhancements. To continue to meet the library needs of staff and students at all schools, this system must be replaced in the near future.

Enterprise Site Licensing

Currently, the Beaverton School District does not have a site license agreement with Apple for operating systems and applications. Lack of a site license agreement means that the operating system that shipped with the computer cannot be upgraded unless a new license is purchased. The impact of this situation is that throughout the District at all school sites, there are a number of different operating systems installed on computers, leading to different capabilities of the computers, different user experiences for students and staff, software incompatibilities depending on the version used to create files, and increased costs for support and administration. Site licensing is common for organizations the size of the Beaverton School District and purchasing a site license for the Apple Operating System (OS) and the applications most commonly used by students and staff in their learning would eliminate most of the issues above. This would greatly streamline computer support, resulting in increased uptime for the equipment and access for students, teachers, and staff.

Activities	**Description**	**Funding & Source(s)** Existing Additional	**Strategic Plan Alignment**	**Evaluation Measures**
Integrated Financial and Administrative Solution (IFAS) – Phase 3	The upgrade of IFAS allows for automation of many tasks. Governance committee established to identify and prioritize IFAS enhancements.	General Fund $56,000 / yr	**R**espect for Human and Environmental Rights	Business process reviews Number of processes automated
Replacement of messaging system	Current messaging system is inadequate for staff collaboration and communication needs. New system would save staff time and improve access and sharing of information.	$120,000 / yr	**H**igh Quality Empowered Teaching Staff	Staff survey Help Desk reports on number of messaging issues
Replace Student Information System (eSIS)	Current Student Information System (eSIS) was purchased and must be replaced due to lack of continuing support from vendor.	General Fund Financial impact study underway	**I**ndividual Student Growth **T**echnology	Project timelines and budget analysis
Replace District Library Management System	Current Horizon system is over 7 years old and has not kept up with advances in technology. The vendor is no longer enhancing the Horizon product and has shifted development efforts toward a new system. The library system handles 1.39 million annual circulations, holds an inventory valued at over $43.5 million with nearly 1.5 million items, and provides students and staff with 24/7 access to their library.	Local Option $ 250,000	**T**echnology	Installation and implementation of a new library management system
Enterprise Site Licensing	Site license exists for Microsoft OS and application suite. A similar site license is needed for Apple hardware and software. This would improve performance, security, and simplify support of 17,000 machines District-wide.	Local Option $ 200,000 / yr	**T**echnology	Help Desk trouble ticket analysis.

Other Trends to Watch for 2011 – 2014

The educational technology landscape can change quickly. There are a number of technologies that need to be evaluated and if found useful and cost effective, could be incorporated into the District. Some of the technologies to watch during the next three years include:

- **Tablet computing**
  Tablets are lower cost computing devices that could be used to consume digital content. Textbook manufacturers are looking at tablet devices to deliver textbooks in a digital form. Pilot projects need to be developed to gauge effectiveness for tablet computing devices.

- **Student-owned devices**
  Nationally, there is much debate on allowing student-owned computers and cell phones into the school environment. Proponents point to student-owned devices as a way to increase technology access at schools and since this is common in higher education, as a way to prepare students for what they will experience after they finish their K-12 education. Skeptics are concerned about distraction and equity issues, as not all students have such devices. In anticipation of determining how best to integrate student and staff-owned devices into the environment, we are building an enterprise wireless network that will have the appropriate safety and security measures.

- **Augmented Reality**
  Augmented reality applications are computer applications that overlay additional information over real still or video images. In the past year for example, augmented reality applications have been created that display additional information over subway and other types of maps. Augmented reality applications have the potential to add detailed, contextual experiences to learning, and already, a number of applications are in development tailored to studies of history, science, and language arts.

Staffing concerns and needs

The budget situation has resulted in staffing reductions in the Information Technology department over the past two years. At this time, there are 46.8 Full-Time-Equivalents (FTE) in the Information Technology Department. Beaverton School District IT staffing levels are just over 50% of IT staffing allocations for the two largest districts in the state. Staffing levels limit the amount of services that can be provided to schools and departments, and despite best efforts, result in delays in problem resolution.

When the budget situation improves and the District has capacity to add back staff, suggested areas for IT would include:

- **Instructional Technology Specialists**
  Information Technologists are certified staff members that bring both classroom teaching expertise and information technology knowledge and skills. Staffing in this department has been reduced over the past few years and yet the teaching and information technology experience provided by instructional technology specialists is critical to developing and harnessing technology to yield maximum effectiveness for learning.

- **Project Planning and Management**
  A consequence of such lean IT staffing levels experienced at the Beaverton School District is the lack of staff devoted to project planning and management. There are a number of standard information technology project and management structures (LEAN, Information Technology Infrastructure Library (ITIL), Six Sigma) that could be used to help improve efficiencies and processes. Likewise, many IT projects are large-scale, extremely complex, involving the coordination of internal staff, external vendors, budgets and timelines. Currently, many staff are fulfilling these roles in addition to their day-to-day responsibilities. A dedicated staff member in this role would provide valuable support and bring operational efficiencies that would increase IT responsiveness.

Data Center and Facilities

The Information and Technology Department and the Data Center are located in the Administration building. The Data Center is a specially configured room that houses all servers and network connectivity equipment and if future growth patterns follow the growth over the past three years, in less than 36 months the Data Center will be at capacity with regard to physical space. Virtualization technology is a method used to reduce the number of physical servers needed by an organization and over the past three years, IT staff have employed virtual server technology to more efficiently utilize Data Center space and to reduce electrical consumption.

Plans must be made soon for a secondary Data Center site. One logical location is an existing Data Center in the Capital Center. The Capital Center Data Center would need to be updated to address Heating, Ventilation, and Air Conditioning (HVAC), Uninterruptible Power Supply (UPS), electrical, and flooring deficiencies. A secondary Data Center is an important part of disaster planning and recovery planning.

Conclusion

The Beaverton School District Strategic Plan places students at the center of our vision and assumes responsibility for their individual achievement. Technology tools, applied appropriately, have the power to engage students, allow for individualized and personalized learning experiences, and foster innovation and creation in each student's learning journey. This technology trajectory will put into place a system supporting individual student learning, teachers connected to each other and to tools enabling collaboration, with equity across the organization, and a solid yet flexible infrastructure that adapts to support new ways in which students, teachers, and parents connect with learning, each other, and other partners in the learning process.

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