

# Portage Public Schools

## *Teaching & Learning with Technology*

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### *A Philosophy and Plan*

July 1, 2017 – June 30, 2020

**Portage Public Schools**  
State District #39140  
ISD: Kalamazoo RESA  
8107 Mustang Drive  
Portage, MI 49002  
(269) 323-5000

*Submitted by:*

Daniel J. Vomastek, Director  
Information and Technology Systems

*Authored by:*

District Technology Leadership Team

- Shane DeRidder, Technical Services Coordinator
- Ryan Miller, Data Systems Analyst
- Paul Murray, Technology Integration Specialist
- Daniel Vomastek, Director
- Jeanna Walker, Media Specialist and Media Team Leader
- Jessica Winstanley, Technology Integration Specialist

A digital copy of this plan can be found at:

<https://portageps.org/departments/technology/>

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# Preface

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This document is the product of hard work, long conversations, and some difficult decisions. Portage Public Schools owes a great deal of thanks to those individuals who contributed to this three-year technology plan. This plan is revision three of a multi-year plan which began in the fall of 2011. It reflects changes in state and federal guidelines, as well as the changing environment and needs of our learning community. It is hoped that this document will be a worthy successor to the highly successful plans which preceded.

The plan itself is an extension of the staff and community feedback provided during our last technology bond cycles. A significant amount of technologies has been purchased – our attention now shifts to working with staff to use these technologies effectively.

This plan is shared with our community via our website, and during regularly scheduled meetings with the community. Comments or questions regarding this plan should be forwarded to the Department of Information and Technology Systems.

# Outline

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This document first outlines our mission, vision, beliefs, and principles. These elements are the most important part of the plan - they guide and shape every section that follows. From there, our current reality is reviewed, followed by goals and purchase plans. Finally, sections outlining budgets and other operational details are included.

# Mission/Vision Statements

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## *Mission*

To empower our users to use technology in a skillful, confident manner and to provide users with the right technologies and training at the right time

## *Vision*

A combined user base of staff, students and community members interacting with technology in a highly interactive, effortless way

## District Background

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Portage Public Schools is located in southwest Michigan, serving the majority of households in the City of Portage, portions of Texas Township, and a few subsections of neighboring municipalities – a total of 6,500 households send their student(s) to Portage each year. Portage serves just under 9,000 students via programs housed in 14 facilities. Historical data regarding student counts, demographics, and other items related to student data can be found at [www.mischooldata.org](http://www.mischooldata.org).

As of the spring of 2017, the technology department consists of 17 staff members. Contracted services are utilized in specialty situations. Support is coordinated via a centralized help desk operation, as well as via dedicated support technicians who rotate through our facilities on a regular basis.

In the fall of 2015, the voters approved \$144 million in bond funds to support the construction of two new middle schools, two new stadiums, and two natatoriums. Included in these funds are roughly \$6 million dedicated to technology upgrades and expansions throughout the district, as well as for our first 1-1 computing initiative.

## Our Beliefs

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Our beliefs function as the fabric connecting our vision and mission to our short and long term goals. They are the litmus tests against which ideas and initiatives are evaluated.

- We are educators first, as such the primary use of technology is to meet the needs of our learners
- There is no need to jump on every new or emerging technology
- There is a need to stay on the cutting edge
- Successful technology systems require a commitment of both human and financial resources

## Principles of the Plan

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- This is a learning plan first, a technology plan second. It is our goal to focus on student and staff outcomes as they use technology rather than the technology itself. The stuff of technology changes rapidly, but not desired outcomes of use. Focusing on those outcomes will make for a more stable, meaningful, and richer plan.

- This plan will address learning not only in the context of technical skills themselves, but also on using those skills in the context of lifelong learning. We will focus on training users on how to use technology, how to use technology in the context of instruction and how to use technology to achieve in all areas.
- This plan will be technology agnostic. We will not favor specific hardware or software but rather focus on what we want said hardware and software to enable us to do. We will avoid choosing technologies that will ‘lock’ us into a specific course of action wherever possible. This will also help us to avoid the urge to jump on the ‘latest and greatest’ technology without first processing its true value and what it can enable us to do.
- This plan will focus on things we can control - goals, expectations, training and outcomes. While funding is important, we understand we cannot assume a certain, evergreen level of funding.
- The goals chosen reflect feedback from all stakeholders – staff, students, parents, and community members.
- This plan will address common expectations for how technology is used for learning via integration of standards and best practices into curriculum and instruction.

## Current Reality

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### *Classroom Hardware*

Each classroom in Portage Public Schools is equipped with a Technology Enhanced Classroom (TEC). These classrooms include touch screen computers connected to large flat panel televisions or projectors, document cameras, microphones, speakers, and multiple auxiliary ports including a connection for assistive listening devices. The technology enhanced classroom provides first-rate technology for instruction.

### *1-1 Deployment*

As of this writing, we are approximately 1/3<sup>rd</sup> of the way through the deployment of our first 1-1 computing initiative. Our 1-1 program consists primarily of Chromebooks. Every teacher is assigned a Chromebook for their use, and we have sets of Chromebooks in every 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> grade classroom. In the fall of 2017 Chromebooks will be assigned to all 6<sup>th</sup>, 9<sup>th</sup>, and 10<sup>th</sup> grade students, with subsequent grade levels receiving devices in the following two school years. Full details regarding the district’s 1-1 program can be found at our 1-1 site, <https://portageps.org/departments/technology/1to1-computing/>.

### *Software*

In this section, software can refer to programs downloaded or installed on client computers as well as hosted solutions or web-based tools residing in the Portage data center or in the cloud.

We currently provide Microsoft Office to our students, faculty, and staff along with several other curriculum-based software programs. We have also invested heavily in web-based applications in order to facilitate anywhere, anytime computing. Indeed, whenever possible we replace client-based software with free or low-cost web-based solutions.

We use Skyward as our primary student information system package, as well as for financial, payroll, and human resource management. Supporting student data systems include Tienet (special education), MealMagic (food service), Destiny (library), VersaTrans (transportation), and SchoolMessenger (notification).

A wide variety of instructional and reference software packages and subscriptions are also provided to teachers and students to support instruction. Offerings vary from year to year based upon needs and curricular initiatives. A full listing is available upon request.

### *Core Systems and Networking*

As a part of our current bond projects, and in preparation for a 5-fold increase in the number of devices on our network, we are investing nearly \$1.2 million in our core systems and network equipment. This work includes, but is not limited to:

- A replacement of all wireless access points to meet the number of current connections and bandwidth requirements for up to three wireless devices per network user
- A replacement of the majority of our network switches throughout the district to strengthen capacity and reliability
- A replacement of our primary storage array to increase capacity and the total number of available concurrent transactions
- A replacement of our core router
- A replacement of firewalls and other security/filtering appliances

Should monies allow, we will also replace ten to twelve physical appliances used to support our end-user virtual computing environment.

These updates should serve district requirements for five to seven years. At which time, it is our hope that another technology bond will be in place to support the next round of upgrades without impacting the General Fund.

### *Collaboration and Communication*

We are currently expanding our resources and tools for collaboration and communication. We continue to train teachers to use these tools with their students and parents. Some of these tools include websites or blogs for classrooms, collaborative software for use with their students (ex. Google apps), and student and staff email. Google Classroom is in wide-spread use, and is a frequent topic of training. The district also makes ample use of bulk email and SMS-based (text) message services.

# Goals

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The goals outlined in this plan will use a simple, four point structure:

- **Completed First Steps** - each goal will articulate the starting point and first few steps taken to solidify the start
- **Ongoing Steps** - each goal will articulate the ongoing steps required for goal attainment and sustainability over time
- **Achievement** - each goal will articulate what its achievement will look like, quantifiably if appropriate
- **Evaluation** - each goal will articulate how it will be evaluated both in the context of the success of the goal and the quality of the implementation of the goal

Note – many of these goals are ongoing in nature. As such, ample progress has already been made on several of them.

## Goal #1: Responsible and Safe Computing for All

Ensuring the online safety of our students is a critical part of planning and day-to-day operations. This task is not limited to protecting students from online threats. Indeed, we must also help students be aware of the affirmations and consequences associated with the choices they make. We must make students aware of their digital legacy and the concepts embedded with digital citizenship. We also acknowledge the importance of training staff in best practices and the opportunity of providing resources to parents.

This goal carries forward from the previous technology plans, and will remain present in all future ones. Given its ongoing nature, many of this goal's steps remain unchanged.

### *Completed First Steps*

- Provide and secure an Acceptable Use Agreement (AUA) from all students as a method for establishing the boundaries of responsible and safe computing
- Meet with Parent Teacher Organizations (PTO's) to plan/promote DigitalEd efforts (see: [DigitalEd.site.portageps.org](https://DigitalEd.site.portageps.org))
- Provide acceptable use guidelines to all staff members

### *Ongoing Steps*

- Embed responsible and safe computing benchmarks into our curriculum, teaching said content at appropriate places and times
- Market DigitalEd

- Continue PTO partnerships for DigitalEd campaign
- Inform/train staff regarding responsible/ethical use of technology and information systems

### *Achievement*

- Documentation of signed AUA's on file
- Inclusion of responsible and safe computing into lesson plans
- Active use of the DigitalEd site
- Growing attendance at DigitalEd events

### *Evaluation*

- Percentage of signed AUA's on file
- Assessment data from relevant coursework
- Parent feedback
- DigitalEd survey data

## Goal #2: Meet Needs of All Students Through Blended Learning

Also carrying forward as an ongoing process-based goal are our efforts to ensure technology is embedded into instruction in a meaningful way. We firmly believe that all students learn in different ways and at different rates; therefore, we promote the instructional method commonly known as “blended” learning. The Clayton Christensen Institute defines blended learning as: a formal education program in which a student learns:

- at least in part through online learning, with some element of student control over time, place, path, and/or pace;
- at least in part in a supervised brick-and-mortar location away from home;
- and the modalities along each student’s learning path within a course or subject are connected to provide an integrated learning experience.

### *Completed First Steps*

- Identify technologies that will support blended instruction
- Develop training materials and professional development options to support those technologies

### *Ongoing Steps*

- Provide professional development for implementing blended learning practices into instruction
- Support systems will be created and implemented

### *Achievement*

- Teachers aware, trained and confident to implement blended learning
- Teachers are able to determine when blending learning is appropriate and if so, to what extent

### *Evaluation*

- Number of teachers using blended learning
- Feedback as collected via grade group, team and other existing meetings designed to discuss and facilitate best practice within Portage Public Schools

## Goal #3: Collaboration

Collaboration also remains as an ongoing goal for our department. In the traditional school setting, technology is oft lauded for its ability to quickly connect students with media-rich information. It is our belief that another aspect, collaboration, is far more important and more powerful. For the purposes of this document, collaboration refers to the technology-facilitated connections between people used to consume, evaluate, and create content. It can be as simple as one teacher creating a lesson plan in partnership with another teacher, or it can be as complex as a team of high school students partnering with a group of college students to research and present on a thematic topic using real-time, concurrent-use software tools.

These collaborations can be broken down into four basic scenarios:

- **Teacher to Teacher** - where individual teachers or a group of teachers connect with other teachers, both within the district and around the world, to plan, analyze student data, process interventions, learn and develop new ideas.
- **Teacher to Student** - thinking beyond the traditional classroom approach with blended and flipped classroom opportunities (see goal #2) along with strategies and tools to increase the exchange of meaningful feedback between teachers and students
- **Student to Student** - students routinely collaborate with each other within school walls and hours... technology can not only enhance these interactions, but also extend them beyond the limitations of time and location
- **Student to Outside 'Experts'** - among the first type of collaborations directly facilitated by technology, including virtual field trips, writing partners, research partnerships, etc.

### *Completed First Steps*

- Whenever a new technology is considered, we will determine the necessity and availability of its ability to allow for the collaboration of users
- We will evaluate the technology from the perspective of the end user

- We will evaluate the market for additional options
- Training needs will be considered prior to any purchase

#### *Ongoing Steps*

- Once selected, new technologies will be introduced to pilot groups to assess simplicity and training needs
- If successful, the larger-scale rollout will be mapped out and communicated.
- Training will be scaled appropriately
- Support systems will be created and implemented

#### *Achievement*

- Entire end-user base trained and proficient
- Support systems tuned to resolve issues within four hours

#### *Evaluation*

- Number of support tickets
- User feedback, formal and informal
- Total Cost of Ownership review

## Goal #4: 1-1 Deployment

New to this plan is our goal of moving Portage to a 1-1 computing environment. This means ensuring every staff member and every student has constant access to a computing device to be used throughout instruction as appropriate. Purchasing enough devices is only the beginning of the process – this goal focuses on the effective use of these devices once purchased, and the ongoing support for the program as a whole.

#### *Completed First Steps*

- Identify appropriate hardware
- Purchase devices for staff and train them prior to delivery of student devices
- Develop rollout and device replacement schedules

#### *Ongoing Steps*

- Deliver student Chromebooks in waves (this is required to ensure proper pacing, as well as set up a financially stable refreshment cycle)
- Provide professional development for staff regarding the best use of student devices

### *Achievement*

- Device rollout to all staff and students complete
- Device replacement schedule enacted

### *Evaluation*

- Staff/student feedback
- Qualitative reviews of instructional practices

## Curriculum Development

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While it is beyond the scope of this plan to detail curricular specifics, we are ever mindful of the need for technology to be both a subject of curriculum as well as an integrated part within the content areas. In summary...

### *Elementary*

The K-5 focus is on foundational learning and computer skills with the primary focus being digital citizenship, computer care, collaboration with fellow students and teachers to share ideas, and the ability to make decisions regarding the appropriate resource and the creation of new knowledge. Library media specialists provide 30 minutes of integrated instruction per week, based on the K-12 Library Media Curriculum. Classroom teachers provide daily instruction as an integrated part of the curriculum, with collaboration from Library Media Specialists.

### *Middle School*

All 6th grade students currently take a 9 week application-based computer class. The future goal for this class is to provide a consistent curriculum, focusing on digital citizenship, including cyberbullying, digital footprints, and using technology to enhance learning. Classroom teachers provide some instruction as an integrated part of the content curriculum. S.T.E.M. (Science, Technology, Math, and Engineering) coursework has completed a successful pilot and has been adopted in a broader context.

### *High School*

Classroom teachers provide some instruction as an integrated part of the content curriculum, with collaboration from Library Media Specialists. Elective classes are offered in desktop publishing, web design, and other web-based applications. The future goal is for technology to be integrated into all content areas, with an emphasis on collaboration and educational networking to enhance student learning.

### *Other Programs*

The technology department routinely collaborates with programs outside of the traditional K-12 offerings. Programs include, but are not limited to, adult education and literacy services, pre-school programming and day care services, and career and arts education. We provide and support computer labs, laptops, Chromebooks, software systems, etc. to facilitate instruction and operations.

## Sustaining Resources

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We consider resources from two perspectives. Obviously, one perspective is 'stuff', the hardware and software systems we use on a day-to-day basis. More importantly, we also consider how to sustain our technological skills - these will always be more important than the 'stuff'.

### Skills

Portage Public Schools believes that providing training for teachers is a critical component of maintaining and enhancing our technology skills/use in the district. In order to facilitate this we offer trainings in a variety of formats, including:

- professional development days
- voluntary before or after school training sessions
- voluntary summer training sessions
- media specialists provided support and training
- daily on-demand trainings
- one-on-one training
- small group trainings
- out of district/ISD level trainings
- professional conferences

Professional development is provided by skilled educators and trainers, including our technology integration specialists, media specialists, data specialist, technology director, and outside resources.

At Portage Public Schools, technology training is focused on not only how the hardware works, but how teachers can integrate various applications into their teaching in order to enhance instruction and learning. These trainings strive to encourage teachers to use current available technologies to reassess how they deliver instruction and manage the classroom.

In addition to training and supporting teachers to use technology for their instruction, we are working to instruct and support teachers on how to be a technology coach for their students. This can come in a

variety of learning opportunities ranging from the simple replacement of traditional resources to complete transformation of how students acquire and demonstrate their understanding of classroom concepts.

By providing technology trainings in a variety of formats and on a wide range of topics and skill levels, we are able to encourage each teacher to embrace their new learning in order to provide the best learning opportunities for our students.

## Hardware and Software

While this plan shifts focus away from technology itself and onto its use, one cannot dismiss the role physical resources play. As with many districts, Portage has invested a significant amount of time and resources in its technology and information systems. As such we are mindful to maintain and refresh our technologies as appropriate.

### Purchase Cycles

For each class of technology deployed, we estimate useful life, budgeting for timely replacement. These life spans can be as little as two years (mobile devices) to as long as 20 (LED-based displays). When it makes fiscal sense to do so, we will refresh technologies with hardware and software updates to extend their useful life.

During the last 20 years, technology bonds have been the primary source of funding for technology capital outlay. At the time of this writing, unallocated funds from our current technology bond total approximately \$750,000. These funds will be reserved for needs that arise until the passage of another technology bond. Spending priorities will be addressed in the following priority:

1. Core systems impacting a large portion of the user base (servers, telephony, safety and security systems)
2. Classroom instructional technologies (AV systems, for example)
3. 1-1 computer replacements
4. Staff computer replacements
5. Other computer replacements

### Emerging Technologies

We are relentless in our search for emerging technologies which could reduce our operational costs and increase our overall flexibility. A great example is our adoption of Chromebooks - they cost much less to purchase and to operate, provide access to all our web 2.0 tools, and integrate seamlessly with our Google Apps for Education services.

### Single-Use Technologies

In general, we avoid single-use technologies. They can tie up significant funds while simultaneously being under-utilized. Clicker systems were an excellent example of this problem. In lieu of clickers,

there are other technologies which can be used to collect informal assessment data much like a clicker yet still be used for a variety of other purposes.

Of course, there are always exceptions to the rule - voice enhancement systems and other AV technologies, tools for special needs students, etc. serve as examples of effective single use applications. Still, the purchase of a single-use technology needs to be carefully considered.

### Bring Your Own Device (BYOD)

While the district offers a 1-1 computing environment, we still encourage staff and students to bring their own computing devices. This 'bring your own device' (BYOD) strategy allows users to provide their own specialty devices (such as translation tools, specialty support and assisted learning devices, etc.) to augment district-provided devices. To be successful, an entity must make several commitments if it wishes to support BYOD. Portage Public Schools has implemented all of the following:

- Networking infrastructure must be device-agnostic, allowing for a wide-range of devices to connect to it.
- Wireless networking should be divided into public and private sides with strict filtering and bandwidth caps on the public side - this will help insure the integrity of the private network and the mission critical services it provides.
- Applicable security technologies should be installed to prevent unintended use of network resources and prevent unauthorized access between devices connected to the BYOD network.
- Direct access to secured systems on the District's network will not be allowed from BYOD devices. Access will be restricted to web services, remote desktops, or virtual desktops.

## Disaster Contingency and Recovery

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Disasters are an infrequent, yet unavoidable part of life. Portage Public Schools has a documented process for disaster contingency and recovery. Details of this process are included in Appendix B.

## Appendix A – Current End-User Device Inventory

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A summary of the current number of devices allocated to end users is included below. At present, PPS maintains a total computer to student ratio of 1:2.5. A detailed inventory is available upon request.

	<b>Desktops</b>	<b>Laptops</b>	<b>Chromebooks</b>	<b>Other</b>
<b>Student</b>	900	1500	7000	30
<b>Staff</b>	1300	175	500	24

## Appendix B - Disaster Contingency and Recovery Plan

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This document is the disaster contingency and recovery plan (referred to as DR) for the Portage Public Schools Technology Department. The information present in this plan guides Technology Department staff (“DR Team”) in the recovery of Technology Infrastructure in the event that a disaster incapacitates or otherwise destroys all or part of the IT infrastructure.

The primary focus of this document is to provide a plan to respond to a disaster that destroys or severely cripples the District's core network infrastructure located in the data center at 8107 Mustang Dr. The intent is to restore operations as quickly as possible with the latest and most up-to-date data available.

This disaster recovery plan has the following objectives:

- To minimize interruptions to normal operation of the network and network services.
- To establish secondary disaster recovery location where minimal services can be restored.
- To provide a restoration of all services.
- To identify the procedures necessary for complete recovery.
- To begin restoration of the primary site.

Immediately following the disaster, all Core Technology Department staff will be notified of the activation of the DR Plan. It may be necessary to request assistance from staff of other departments depending on the extent of the disaster.

The initial steps in activation of the DR plan are to identify and attempt to salvage any functioning systems and protect them from further risk. This may include physically removing the hardware or components from the installation location. Precedence is given to storage media, core network switching devices, and server equipment. These items must be removed and protected from the elements or moved to a clean, dry environment away from the disaster site.

While salvage operations are in effect, the DR Team will perform a survey to determine a suitable location to restore services, should the primary site be impractical. The planned DR Site is located at Portage Northern High School (NHS) in the second floor MDF closet. As salvage operations commence, work will proceed to bring the DR site online. A decision will be made by the DR Team whether to use the DR Site or an alternate location to temporarily restore services. In the event that NHS is deemed unsuitable, efforts will begin to relocate the secondary storage array from NHS to the alternate location.

This DR Plan relies heavily on existing support services provided by the vendors of our infrastructure equipment. As equipment is identified as destroyed or non-recoverable, immediate contact to vendors for rapid replacement of critical systems will begin. In the event vendors are unable to provide identical replacements of equipment, the DR Team will make any required substitutions.

As salvaged or replacement equipment arrives, it will be joined up with existing equipment from the DR Site. As it is difficult to plan for every disaster, it may be necessary for the DR Team to deviate from this

plan as the situation requires. Once equipment is reinstalled, efforts to restore network services will begin, starting with the most critical systems, identified in this order:

1. Core Network Infrastructure
2. DHCP Services
3. Domain Name Services (DNS)
4. Storage Array
5. Voice/Telephony
6. Wireless Network Infrastructure
7. Windows Domain Controllers
8. File Servers
9. Hosted Application Services
10. Video Surveillance Systems
11. Other Systems

Once the DR Site is operational and core services have been restored, the team will begin focusing on recovery of the primary site. The DR Team will then determine if the original site is suitable for recovery, or a new permanent location for network services is required. As each disaster is unique, the process of coming to this decision is outside the scope of this document.

### *Equipment Vendors*

#### **Dell Compellent**

(866) 397-8673

Primary Storage Array ID: 7296/7297

Secondary Storage Array ID: 7298

#### **Presidio**

6355 East Paris Ave SE,

Caledonia, MI 49316

(616) 871-1500

(No Contract or any other ID needed, just company name)

#### **Lightspeed Systems**

(877) 447-6244

#### **Liebert/Emerson Network Power**

(800) 543-2378

Mustang Drive Site ID: 113976

Northern High School Site ID: 88836

### **Approved Protection Systems**

(800) 339-1579

### **ROK Systems**

(616) 532-7995

### **CTS Communications**

(800) 627-5287

### **EPS**

(616) 459-1282

## *Identified Equipment*

### **Core Network Systems**

- **Nexus 9508 Core-Switch**
  - (8) N9K-X9464PX 48x1/10G SFP+ 4x40G Ethernet Module 52 SFP Ports
  - (6) N9K-C9508-FM Fabric Module
  - (2) N9K-SUP-A Supervisor Module
  - (2) N9K-SC-A System Controller
  - (4) N9K-PAC-3000W-B Nexus9000 C9508 Chassis Power Supply
  - (3) N9K-C9508-FAN Nexus9000 C9508 Chassis Fan Module
  
- **Cisco 6509E Core Switch**
  - VS-SUP2T-10G 5 ports Supervisor Engine 2T 10GE w/ CTS (Primary)
  - VS-F6K-MSFC5 CPU Daughterboard
  - CVS-F6K-PFC4 Policy Feature Card 4
  - S2TISK9-15101SY IOS IP SERV FULL ENCRYPT
  - VS-SUP2T-10G 5 ports Supervisor Engine 2T 10GE w/ CTS (Secondary)
  - VS-F6K-MSFC5 CPU Daughterboard
  - VS-F6K-PFC4 Policy Feature Card 4
  - S2TISK9-15101SY IOS IP SERV FULL ENCRYPT
  - WS-X6908-10G DCEF2T 8 port 10GE
  - X2 Transceiver 10Gbase-SR (x2)
  - WS-F6K-DFC4-E Distributed Forwarding Card 4
  - WS-X6748-SFP CEF720 48 port 1000mb SFP
  - 1000BaseLH (x14)
  - GLC-T (x12)
  - WS-F6K-DFC4-A Distributed Forwarding Card 4
  - WS-X6748-SFP CEF720 48 port 1000mb SFP
  - 1000BaseLH (x12)
  - GLC-T (x8)
  - WS-F6K-DFC4-A Distributed Forwarding Card 4
  - WS-X6748-GE-TX CEF720 48 port 10/100/1000mb Ethernet
  - WS-F6K-DFC4-A Distributed Forwarding Card 4

- WS-X6748-GE-TX CEF720 48 port 10/100/1000mb Ethernet
- WS-F6K-DFC4-A Distributed Forwarding Card 4
- WS-C6509-E-FAN 1 - Enhanced 9-slot Fan Tray
- (2) WS-CAC-6000W - AC power supply, 6000 watt
  
- **Cisco 4110 Firepower 1**
  - Base - Cisco Firepower 4110 Threat Defense License
  - Malware - Cisco Firepower 4110 Threat Defense License
  - Threat - Cisco Firepower 4110 Threat Defense License
  - Cisco Firepower Management Center for VMWare
  
- **Cisco 4110 Firepower 2**
  - Base - Cisco Firepower 4110 Threat Defense License
  - Malware - Cisco Firepower 4110 Threat Defense License
  - Threat - Cisco Firepower 4110 Threat Defense License
  - Cisco Firepower Management Center for VMWare
  
- **Cisco 8510 Wireless LAN controller**
  - (2) 2x Cables
  - LIC-CT8500-500 - 500 AP License for Cisco 8500 Wireless Controller
  
- **Misc. Switches**
  - (4) WS-C3850X-24P-L (NHS Core)
  - (3) WS-C3850X-48P-L (CHS Core)
  - (2) WS-C3750X-24T-S
  - (1) WS-C3750X-24P-S
  - (1) WS-C3750X-24PF-S
  - WS-C3560G-48TS-S (ILO)
  - WS-C3560G-48PS-S (MGMT)
  
- **Routers**
  - (9)Cisco C881 Router Chassis
    - License advipservices
    - PVDMM2-16 PVDMMII DSP SIMM
  - (3)Cisco ISR 4321 Router Chassis
    - PWR-4320-AC 110w AC Power Supply for Cisco ISR 4320
    - ACS-4320-FANASSY
    - ISR4321/K9 Cisco ISR 4320 Built-In NIM Controller
    - NIM-2FXO NIM-2FXO Voice Analog Module
    - NIM-4FXS NIM-4FXS Voice Analog Module
    - ISR4321-2x1GE Front Panel 2 Port Gigabitethernet module
    - ISR4321/K9 ISR4321 Route Processor
    - ISR4321/K9 ISR 4321 Forwarding Processor
    - License uck9
    - License ipbasek9
    - License cme-srst

- (2)Cisco ISR 4331 Router Chassis
  - PWR-4330-AC 250w AC Power Supply for Cisco ISR 4330
  - ACS-4330-FANASSY
  - ISR4331/K9 Cisco ISR 4331 Built-In NIM Controller
  - NIM-2FXO NIM-2FXO Voice Analog Module
  - NIM-4FXS NIM-4FXS Voice Analog Module
  - PVDM4-32 PVDM4-32 Voice DSP Module
  - ISR4331-3x1GE Front Panel 3 Port Gigabitethernet module
  - SM-X-NIM-ADPTR SM-X Adapter for one NIM Module
  - NIM-4FXS Voice Analog Module
  - ISR4331/K9 ISR4321 Route Processor
  - ISR4331/K9 ISR 4321 Forwarding Processor
  - License uck9
  - License ipbasek9
  - License cme-srst
- Cisco ISR 4351 Router Chassis
  - PWR-4450-AC 450w AC Power Supply for Cisco ISR 4450
  - ACS-4450-FANASSY
  - ISR4451/K9 Cisco ISR 4351 Built-In NIM Controller
  - NIM-2FXS NIM-2FXS Voice Analog Module
  - NIM-4FXS NIM-4FXS Voice Analog Module
  - NIM-4FXS NIM-4FXS Voice Analog Module
  - ISR4331-3x1GE Front Panel 3 Port Gigabitethernet module
  - SM-X-NIM-ADPTR SM-X Adapter for one NIM Module
  - NIM-2FXO NIM-2FXO Voice Analog Module
  - SM-X-NIM-ADPTR SM-X adapter for NIM module
  - NIM-4MFT-T1/E1 Serial Module
  - PVDM4-128 Voice DSP Module
  - ISR4351/K9 ISR4321 Route Processor
  - ISR4351/K9 ISR 4321 Forwarding Processor
  - License uck9
  - License ipbasek9
  - License cme-srst
- **Web Filtering Equipment**
  - Lightspeed Systems Rocket - Dual Bridge
  - (2) Lightspeed Systems Rocket - 10G
- **Access Control Equipment**
  - S2 Enterprise NetBox
- **Environmental Monitor**
  - Geist Watchdog 1250
- **Storage Systems**
  - Fiber Channel Network

- (4) Brocade 300-Series FC Switch
  - Compellent Storage Array (Primary)
    - (2) Dell Compellent SC8000 Controllers
      - Dual-Port Gigabit iSCSI Card
      - Cache Card
      - (2) Quad-Port 8Gbit Fibre Channel Card
      - (2) Quad-Port SAS Controller
      - SSD Enclosure
        - (24) 1.8TB Read-Intensive 2.5" SSD Drives
      - (4) Spindle Enclosures
        - (12) 4.0TB 7.2k RPM SAS Drives
  - Compellent Storage Array (Secondary)
    - (1) Dell Compellent SC8000 Controller
      - Dual-Port Gigabit iSCSI Card
      - Cache Card
      - (2) Quad-Port 8Gbit Fibre Channel Card
      - (2) Quad-Port SAS Controller
      - (4) Spindle Enclosures
        - (12) 4.0TB 7.2k RPM SAS Drives
- **Server Infrastructure**
  - Network Monitoring VMware Cluster
    - (2) Cisco R210 Servers
      - 48GB RAM
      - 2x Dual-Port QLogic 10G ethernet card
  - Primary VMware Cluster
    - (10) Dell R710 Server
      - 192GB RAM
      - 192GB SSD Cache Disk
      - Quad-Port Broadcom Gigabit Ethernet Card
      - Dual-Port Broadcom iSCSI Card
      - Dual-Port QLogic 4Gbit Fibre Channel Card
      - 2x Dual-Port QLogic 10G SFP+ Card
  - Virtual Desktop Cluster
    - (9) Dell R510
      - 32gb RAM
      - Dual-Port QLogic 4Gbit Fibre Channel Card
      - 2x Dual-Port QLogic 10G SFP+ Card
  - Web Caching Cluster
    - (2) Dell R730
      - 128GB RAM
      - Dual-Port QLogic 10G SFP+ Card
      - Dual-Port QLogic 4Gbit Fibre Channel Card
- **IPTV Systems**
  - 4 Silicon Dust HDHomeRunTECH3-6CC (24 channels)
  - 8 Cable Cards & Motorola Tuners (Provided by Charter Communications)

### **Data Center Systems (8107 Mustang Drive Site)**

- **Battery Backup**
  - (2) Liebert Nfinity 20 kVA w/6 Battery Modules
- **Generator**
  - Generac
- **Computer Room Air Conditioners (CRAC)**
  - 2 Liebert Challenger 3000 (5 ton)
  - 1 Liebert PDX (5 ton)
- **Fire Suppression**
  - FM-200
- **Environmental/Security Monitoring**
  - EPS

### **Disaster Recovery Site Systems**

- **Battery Backup**
  - Liebert Nfinity 16kVA w/5 Battery Modules
- **Generator**
  - Generac
- **HVAC**
  - Liebert DataMate x2
- **Fire Suppression**
  - Water Sprinkler System
- **Fiber Optic Cabling Plant**
  - Maintained by CTS

## Appendix C – Technology Bond Budget

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In the fall of 2015, a \$144 million bond proposal was approved by the voters. Not including technology funds tied directly to new construction, approximately \$6 million in bond funds were set aside for other projects. As of this writing, this \$6 million is allocated as follows:

<b>Infrastructure</b>				
<b>Location</b>	<b>Description</b>	<b>Quantity</b>	<b>Unit Cost</b>	<b>Total Cost</b>
Selected Elementary Sites	Replace Aging Public Address Systems	5	\$40,000	\$200,000
District-Wide	Fiber Ring Upgrades	1 mile	\$20,000	\$20,000
District-Wide	Core Switch and Controller Upgrades	1	\$949,181	\$949,181
District-Wide	Other Data Center Upgrades	1	\$363,742	\$363,742

<b>Student Computing</b>				
District- Wide	1-1 Computing Initiative	8520	\$230	\$1,959,600
District-Wide	Lab Replacements	1000	500	\$500,000

<b>Staff Computing</b>				
District-Wide	Desktop Replacements	550	\$700	\$385,000
District-Wide	1-1 Computing Initiative	525	\$389	\$204,120

<b>Other</b>				
District-Wide	Contingency	1	\$778,357	\$778,357
New Middle Schools	Audio/Visual Systems	90 rooms	\$7,000	\$630,000
District-Wide	Contracted Services	1	\$300,000	\$300,000

<b>Grand Total</b>				<b>\$6,290,000</b>
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*These figures do not include technology costs triggered by facility remodeling or new construction.*

It is understood these figures will vary throughout the bidding process and purchase cycles.

## Appendix D – Formally Approved Technology-Related Regulations, Acceptable Use Agreements, and Supporting Policies and Regulations

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As per State and Federal guidelines, Portage Public Schools maintains a thorough set of expectations and regulations regarding the use of technology. These items can be found on the District’s website at <https://drive.google.com/file/d/0BwyqMHse0KezTDNRdy1wZ0tjclk/view>

As a part of these regulations, Portage Public Schools complies with the Child Internet Protect Act by monitoring and filtering internet access. Information regarding internet filtering in Portage Public Schools can also be found on the District’s website at <https://sites.google.com/a/portageps.org/digitaled/resources/internet-filtering/internet-filtering-and-portage-public-schools>

## Appendix E – Operating Budgets

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The 2017-2020 budgets for technology operations follows the general outline and amounts as shown below. As many of these costs can vary (unexpected service outages, variances to maintenance agreements, etc.), the actual expenditure amounts will change from year to year. Actual expense data (including salary information not included below) is located on the district website at <https://portageps.org/departments/finance/>.

Category	Average Annual Budget
<b>Media Supplies (books, magazines, etc.)</b>	\$55,000
<b>Media &amp; A/V Equipment Maintenance</b>	\$32,000
<b>Media Memberships and Instructional Fees</b>	\$26,500
<b>Media Processing</b>	\$3,400
<b>Core Technology Maintenance Agreements</b>	\$250,000
<b>Contracted Service Fees</b>	\$5,000
<b>Internet Service</b>	\$20,000
<b>Telephone Service</b>	\$35,000
<b>Computer Repair/Replacements</b>	\$85,000
<b>Infrastructure Maintenance/Contingency</b>	\$30,000
<b>Trainings and Dues</b>	\$20,000
<b>Supplies and Mileage</b>	\$8,000
<b>Copy/Print</b>	\$87,000
<b>Client Software Licensing</b>	\$57,000
<b>Student Data Systems</b>	\$113,000
<b>Operating Data Systems</b>	\$142,000
<b>Instructional Software Subscriptions and Related Support</b>	\$61,000