Alexander Central School

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Technology Plan

2018-2021

Alexander Central School District's Mission Statement:

The mission of the Alexander Central School District is to challenge students to be confident, contributing learners within a structured, safe and caring environment.

Technology Mission Statement:

The mission of the Technology Department is to create the conditions to support teaching, learning, and collaboration throughout the District.

Planning process for this 3-year technology plan:

The Alexander School District has a Technology committee with stakeholders from the district and the Alexander community. The current membership has the following members: Superintendent, Business Manager, Librarian, High School Teacher, Elementary Teacher, A Parent, A Student, The Director of Special Education, and The IT Coordinator.
The Alexander School district's strategic planning process with its committee has assigned a set of 4-year goals for the school district. The goal that the technology committee aligns itself to is: "Our technology infrastructure will continue to evolve in order to support teaching, learning, and collaboration." The technology committee has aligned its goals with this district goal in all of our decision making. The technology committee meets twice or more a year and shares progress on our goals through email. As the previous 3-year technology plan was finishing up the technology committee reviewed surveys, reports, and presentations on the progress of our goals. The technology committee discussed our plans for the goals of the 2018-2021 Technology plan based on successes from the previous 3 years, trends in educational technology, and suggestions from stakeholders in the district. The technology committee has sent out and reviewed community surveys, a pilot program, and district staff surveys all in review of what the goals for the 2018-2021 technology plan will be and how to monitor the progress of said goals to make sure it is meeting the district's goal of building a technology infrastructure will continue to evolve in order to support teaching, learning, and collaboration in the years to come.

Goals:

The Alexander district with its Technology Committee and it's IT coordinator has identified the following goals for its current 3 year technology plan. These goals will benefit from the previous three years of upgrades to the network infrastructure and devices. The stakeholders of the technology committee along with the districts technology coordinator have based these goals on our technology mission statement of making sure our technology infrastructure evolves to meet the needs of our learners and staff.

Goal 1: The district's technology committee has identified the need to replace its aging SMART Technologies SMART Boards which are now 10 or more years old. The SMART Boards are already showing their age with failing controller boards that affect alignment with their projectors. Even with the replacement of these controller boards, the SMART Boards need to be aligned multiple times a day. The district's Smart Boards have a 4:3 ratio board size which is no longer the norm for screen sizes on any device used in the district. SMART no longer manufactures the interactive whiteboard which has made a replacement with similar technology impossible. The technology committee has identified that to keep our interactive classroom model the district's classrooms will need to replace their SMART Technologies interactive whiteboards with display televisions. These televisions have long lives and do not require bulb replacement or cast a shadow of the presenter on the screen. Display televisions have a modern 16:9 screen ratio and save the presenter time by not having to align a projected screen to the touch interface. Unlike the single touch technology of our classroom SMART boards, modern display televisions have multi-touch technology that allows for gesture control and allows multiple presenters to use the display television at the same time.

To prevent a long professional development phase to this new equipment, the district is only looking at display televisions that are 100% compatible with the SMART Notebook software. The SMART Notebook software has been used by Alexander's teachers since SMART Boards were introduced to the district. This will allow our teachers and students a seamless transition from SMART boards to display televisions and allow past digital resources to be used with the new technology without the need to redo work or find new resources.

The district has already tested these screens in the 2017-2018 year. The district has had 3 companies provide test units to the school where other stakeholders could come and test the units in a classroom or library environment using software they are already familiar with. Teachers, Students, and technology committee members have been able to use this new technology and have responded to a list of questions about their opinions of these devices. Additionally, the IT coordinator has visited other school districts with the technology we are looking at to speak to their stakeholders and see the technology in use.

The district plans to fund this goal for the 2018-2019 school year with its second Smart Bond Proposal. The proposal will be for funds to purchase the 74 Display televisions we would need to outfit each classroom in the District. These units will also require wall mounts, portable mounts for at least 4 units, and a team to install the equipment in each classroom. In this project, we will also purchase computer speakers for each room if we can not find a Display television with adequate speakers for the classroom. As of the writing of this goal, the tech committee and stakeholders who used the demo units we have brought in to the district are looking at the SMART Board 6000 series Display Television to best fit our goal.

Action Plan steps for Goal 1:

1. The districts technology committee and the technology coordinator have met with vendors and researched what will be the best fit for our already existing interactive classroom model. Different models of display units have been lent to the district for evaluation purposes. The evaluation units have been used in different school

environments like classrooms, library, training centers to test the equipment's use in each area. Our current Notebook software is tested on each unit to make sure compatibility exists between the hardware and software. Surveys will be handed out to all stakeholders including teachers and staff members like librarians and professional development instructors on their impression of the evaluation equipment. Completion date Novemeber 2018

2. A Vendor list of all equipment needed to replace the districts old classroom SMART Boards will be given to the technology committee for review. Completion date Feburary 2019
3. The district plans on handing in its second SSIP plan to the state for funding on this project. A quote will be received from the vendor of the technology committee's choice of the correct display unit for the district's needs. The district plans of using the same BOCES wiring and installation that it used in its first SSIP to install the wall mounts, the displays, and run any cabling needed. Completion date July 2019.
4. Professional development training in either before and after school sessions or during Superintendent conferences days will be provided as is listed in the Information Technology Professional development plan. Training in the new version of Notebook Software and operation of new Display Hardware will be provided with post-training surveys to evaluate the professional developments effectiveness. Completion Date: September 2019

Goal 2: The district is working to bring our Chromebook levels to a 1:1 ratio with the students from 5th grade to the 12th grade. A Chromebook for each student would open more possibilities for our teachers and students. After the installation of full district WiFi in the 2017-2018 Smart Bond plan, these mobile devices can be used anywhere in the district. With digital textbooks, web resources, and other digital curricula available to our learners and teachers, the Chromebook is both a great 21st-century resource and can save on costs in other areas. Mobile devices like Chromebooks eliminate the need for the districts stationary Windows labs which require furniture, a classroom space, and non-mobile Windows workstations that cost nearly 3 times as much as a Chromebook. Alexander uses G-Suite accounts for all staff and all students from the 4th grade to 12th which the Chromebook takes advantage of giving each user cloud storage and a set of applications they can access in or out of district.

The district's technology committee has identified Chromebooks and reaching a 1:1 ratio with students to devices as a goal for this 3-year technology plan. A lot of work has been done in the previous two years to get to make this a goal for the district's technology. The technology committee sent home a survey to each student household asking about their home internet environment at the end of the 2016-2017 school year. This information was the starting point of the district's research into the feasibility of sending Chromebooks home with students. We learned at that time that about 20% of households in the district do not have internet in the house, and out of that group, only 80% had WiFi in the home. After reviewing the results of the survey the technology committee agreed on a pilot program of students taking Chromebooks home for one classroom in the 5th grade. This pilot started in the 2017-2018 school year and finished in June of 2018. During the course of the pilot, the Chromebooks were set up to work in either an environment with WiFi or an environment without internet access for the

Chromebooks. Students with no internet access could still work on documents saved locally to their assigned Chromebook and have those documents automatically synced to their Google Drive account as soon as the returned to the school. The pilot was a success to all stakeholders involved and the results were brought back to the Technology Committee.

Entering the 2018-2019 school year the district is still not 1:1 with its Chromebooks. The first year of this 3 year technology plan we will add 4 more classroom carts that are shared between departments and grade levels. Funding is the main reason why the district is not 1:1 at any grade level. The technology committee and the IT department are reluctant to use Smart Bond funds on Chromebooks because they have a service life of only 4 years before the need for replacement whereas all of our previous and planned Smart Bond proposals have a service life of 8 or more years. Removing Windows PCs with Chromebook replacements will help as the Windows PC is between 2 to 3 times the cost of a Chromebook. The district will look to its own budget, grants, and cost savings in other areas to grow its Chromebook ratio and try to reach 1:1 with students during this 3-year technology plan.

Action Plan steps for Goal 2:

1. The district's technology committee started the planning process for 1:1 Chromebooks in the 2016-2017 school year. Chromebooks were chosen based on the district's use of the G-Suite of applications and the inexpensiveness of Chromebooks in relation to Windows PCs. In October of 2017 a survey was sent home to households to gauge what the technology environment was like at home and what potential roadblocks there might be to sending Chromebooks home with students. This home technology survey will be repeated in 2018 to compare how the environment might have changed in the last 2 years. In the 2017-2018 school year, a classroom pilot was run in one 5th grade classroom where each student was assigned a Chromebook and was allowed to take the Chromebook home after school hours. All of these evaluations have been reviewed by the technology committee and district administrators. in the 2018-2019 school year we will plan how the district can purchase enough Chromebooks for students in a grade level and whether students should be permitted to take the Chromebook home or if they are to stay in school. Completion date: March 2019
2. The district is looking into different funding opportunities to make 1:1 technology for 5th-12th grade a reality. Grants like the T-Mobile for Education's technology program for schools is being looked into by the director of technology. E-Rate funding and Textbook funding are another possible paths. The technology committee and the Director of technology have not wanted to look to a SSIP because to maintain 1:1 technology for the future the district will have to maintain the budgeting for replacement equipment on a logical replacement plan for Chromebooks. Multi-year payment plans are also a possibility through our BOCES. The Distinct leadership team and the districts Business Manager, along with the district technology committee will decide how we will fund 1:1 Chromebooks. Completion Date: August 2019
3. The district will go 1:1 with every student from 5th-12th grade by staggering 1:1 implementation over 2-3 school years starting with 9th-12th grades and then moving on to the Middle School students grades 6th-8th and the 5th grade. Based on the touchscreen, 11.6 inch Chromebooks we have been purchasing and have been very successful in the district, each student Chromebook will cost $260. If the district decides to send each student home with their Chromebooks then the

district will have to purchase cases for each Chromebook and extra Charging cables. If the Chromebooks stay in the district then the district will have to purchase lockable charging carts to accommodate each Chromebook. Either possible implementation of 1:1 Chromebooks will probably cost the district $350 per student. This action item is to go 1:1 with the 9th-12th grades. Completion Date: July 2019

4. Purchasing 1:1 Chromebooks for 5th - 8th grade. Completion Date July 2020.
5. The district will need to look into insurance plans for households if the students take Chromebooks home. The Technology Coordinator will reach out to other districts that have implemented 1:1 take home devices and insurance on said devices to see what the cost would be to each household. The technology committee will review insurance possibilities and make recommendations on what would work best for our stakeholders.

Goal 3: The district is working on infrastructure upgrades it started with the 2017-2018 Smart Bond proposal. During the 2017-2018 school year the district installed 11 new switches which both replaced older switches and provided the district with power over ethernet needed to run the access points providing WiFi to the district. Also, the district had it's multi mode and single mode fiber optic lines cleaned, re-terminated, and tested between the Middle_High and Elementary Buildings providing the district with a 10 Gbps connection between buildings.

The district IT department and the technology committee would like to finish updating the schools infrastructure in the coming 3 years of this technology plan. The district has 11 data switches in it's wiring closets that are older, with a focus on 6 data switches that are at the end of life for their warranty and should be replaced during the scope of this 3 year plan. Each of the 6 switches are 48 port data switches, but some may be replaced by 24 port switches because of the reduction of wired stationary Windows PCs.

Along with the Switch replacements, the district would like to upgrade it's fiber connections inside each building from it's main closet to it's edge closets. The district currently has multi mode fiber connections to these closets. The technology committee will look to whether the existing multimode can be cleaned and reterminated to reach 10 Gbps speeds, or whether new multi mode or single mode fiber should be run to each of these closets.

The district plans to work with the same BOCES department that did our 2017-2018 Smart Bond project to plan for the 2019-2020 school year has the goal timeframe for this work. The district will use BOCES funds and E-Rate to achieve this goal.

Action Plan steps for Goal 3:

1. Meeting with BOCES, Corning, and Cisco to plan out the replacement of 11 older data switches and the run of Fiber optic cable between the Server closet and edge wiring closets in the school to obtain 10-gigabit speeds to all switches in the district. Most switches will be data switches but hybrid switches will have to be planned to provide power over Ethernet for future projects like the expansion of Security cameras or the expansion of IP Phones in offices or classrooms. Completion Date: January 2020
2. The district plans on making this goal as it's third SSIP for funding. Quotes will be obtained by Corning Fiber Optic, Cisco, and/or BOCES for equipment and installation. The Third district

NYS SSIP will be started after the completion of its 2nd SSIP plan. Completion date: Feburary 2020

3. The District currently has multi-mode Fiber optic cable between its sever closet and edge wiring closets. The fiber optic will be tested to see if it just needs cleaning and re-terminated to reach our speed requirements to meet our goal, or whether new Fiber optic lines will have to be run. Completion Date: February 2020
4. Quotes will be obtained for the correct switches that meat our goal, and the fiber optic will either be re-terminated or new Fiber optic that will be run in the district to the edge closets. The funding will be part of the districts 3rd SSIP to the state of NY. Completion Date: July 2020

Goal 4: The District is looking to expand its security camera coverage inside the building and throughout its grounds. Additional cameras, infrastructure wiring, and a larger server to retain the stored camera footage will be needed to meet this goal. It's of the opinion of the Leadership team and the building principals that there is a need to purchase more security camera to cover spots on the district campus that are currently not antiquity covered. The district currently has 31 cameras in the district. Eight of the cameras are outdoor cameras that cover the district grounds. Working with the building principals, the leadership team, the technology committee, and our security system vendor the district have identified that at least an additional 21 cameras could be purchased and installed in identified areas that would improve the districts security camera coverage. This expansion of the already existing security camera system would require the installation of network cabling to each new security camera which will be provided by either the district maintenance department or our security system vendor. The additional cameras would also require more powered over Ethernet switches to feed the data and power to each new camera. This goal would also require either the expansion of the current security camera server or the purchase of a new security camera server to accommodate the additional storage capacity needed to retain footage for 30-60 days. The server will not only have to handle the additional storage of data provided by more security cameras. The new camera's added in a project like this will likely be of a higher resolution than the current 1-megapixel security cameras and therefore each new camera will have a larger data footprint per hour of footage stored. The district is looking towards the next 3 years to implement this expansion of its security camera system.

Action Plan steps for Goal 4:

1. The district will need about 21 additional security cameras to meet its security goal. Locations for these cameras have already been proposed by the building principals. The technology director and leadership team will need to meet with our security camera vendor to decide which type of cameras will be best for each location chosen. Once the cameras are chosen, the district along with the vendor will have to upgrade or build a new server that can accommodate the new data needs of recorded video storage for 21 more security cameras. Completion Date April 2019.
2. New Network lines will have to be run from the closest edge closet to the location of the new security camera. Depending on available POE ports to provide both power and data to each camera, more Power over Ethernet switches may have to be purchased to accommodate the new cameras. Completion date: July 2019

3. The purchase of 21 security cameras and either the upgrade of the current Security camera server or the purchase of a new security camera server may be funded with a 4th SSIP to the state or district funds may be used. Completion Date: July 2019.
4. Training for the Security camera software will be given to the Director of technology, the Elementary Principal, the HS/MS Principal, the district SRO, and the assistant principal by the vendor, to turn these users into turn-key trainers for any future employee whom might need access in the future. Completion Date: September 2019

Measurement and Evaluation of district technology Goals:

The technology department along with the technology committee will be working with stakeholders of each goal closely to measure the goal's effect in real time to make any changes necessary to assure the goal's success to its students, teachers, and staff. To evaluate the outcome of our goals the district will start with surveys given to our teachers, students, and the stakeholders of each goal that will then be evaluated by the leadership team, including the building principals, director of pupil personnel, director of curriculum and instruction, the technology committee, and the district leadership team, to identify areas that need growth. More stakeholder committees may also be involved in this process if the surveys identify areas of their concern. Committees like the district Safety Committee and the Professional Development Team, as well as other district teams and committees when identified, will be informed of the results so that they may make suggestions or changes to their own plans to accommodate the stakeholders of each goal. Faculty meetings, grade chair meetings, and superintendent conference days will also be utilized to obtain stakeholder feedback. For each goal implemented an action plan will be agreed upon by the IT department and the technology committee. Stakeholders will be surveyed as to the effectiveness of each action plan.

Information Technology Professional Development Plan:

The districts technology department works closely with the district's Professional development team to make sure that the professional development needs of the technology 3-year plan are aligned with the district's Professional Development Plan. Like the district's plan, the instructional technology professional development plan is continuous and sustained for the span of the 3-year technology plan and its goals. It will indicate how classroom instruction and teacher practice will be improved and assessed, and it includes an evaluation of the effectiveness of instructional technology professional development and a mechanism to adjust its goals based upon stakeholder feedback and evaluation.

Goal 1 Information technology professional development plan for Classroom display units:

- Essential Question: How can the implementation of the upgrade of the interactive

classroom display units be implemented in a way to assure seamless classroom integration.

- Objective: Teachers will be provided training on the newest version of the already well-known Notebook software and the use of the new display hardware.
- Strategies/Activities: Provide training in the changes to Notebook software and any interface changes. Provide training in the operation of the new interactive classroom display hardware.
- Inputs: Professional learning opportunities before and after school training sessions and/or superintendent conference day training.
- Evidence: Post-training surveys, faculty meeting discussions and review by technology committee and Technology coordinator
- Responsibility: Technology Coordinator.
- Timeline: Summer of 2019 and 2019-2020 School year.

Goal 2 Information technology professional development plan for 1:1 Chromebook integration:

- Essential Question: How can the implementation of 1:1 Chromebooks from 5th - 12th grades meet NYS technology standards. How to prepare all stakeholders including Teachers, Staff, Students, and district households. Will these Chromebooks stay in the district or be sent home with students after the school day has ended.
- Objective: Provide a Chromebook for each student in grades 5th through 12th. Provide stakeholders with the proper training in the use of Chromebooks for curriculum-based instruction in all classes.
- Strategies/Activities: Provide teacher professional development in the use of Chromebooks. Training in the use of the G-Suite set of tools and classroom management tools like Google Classroom and GoGuardian for teachers.
- Inputs: Professional learning opportunities before and after school training sessions and/or superintendent conference day training. Turn-key Teacher to teacher instruction
- Evidence: Student and Teacher surveys. Teacher workshops.
- Responsibility: Technology Coordinator, Director of Curriculum and Instruction, Technology Committee.
- Timeline: 2019-2020 School Year.

Goal 3 Further Infrastructure Upgrades to older switches.

- Essential Question: What new switches and Fiber Optic installations will be needed to ensure the goal of 10-gigabit speeds to all wiring closets and the replacement of older/slower switches.
- Objective: Identify the 11 older switches in the district that need replacing and their best replacement candidate, and identify fiber optic runs between the server closet and edge closets that need to be installed.
- Strategies/Activities: Meet with Cisco providers and BOCES/Corning fiber optic professionals to identify the needs of the infrastructure to meet the goal.
- Inputs: Workshops with BOCES and Corning experts in the current district infrastructure needs. Training in the difference between multimode and single mode fiber optic lines to identify the best fit for our district technology goal.
- Evidence: 3rd party BOCES team evaluation of the action plan.

- Responsibility: Technology Coordinator and Technology committee.
- Timeline: Summer of 2020, 2020-2021 School Year.

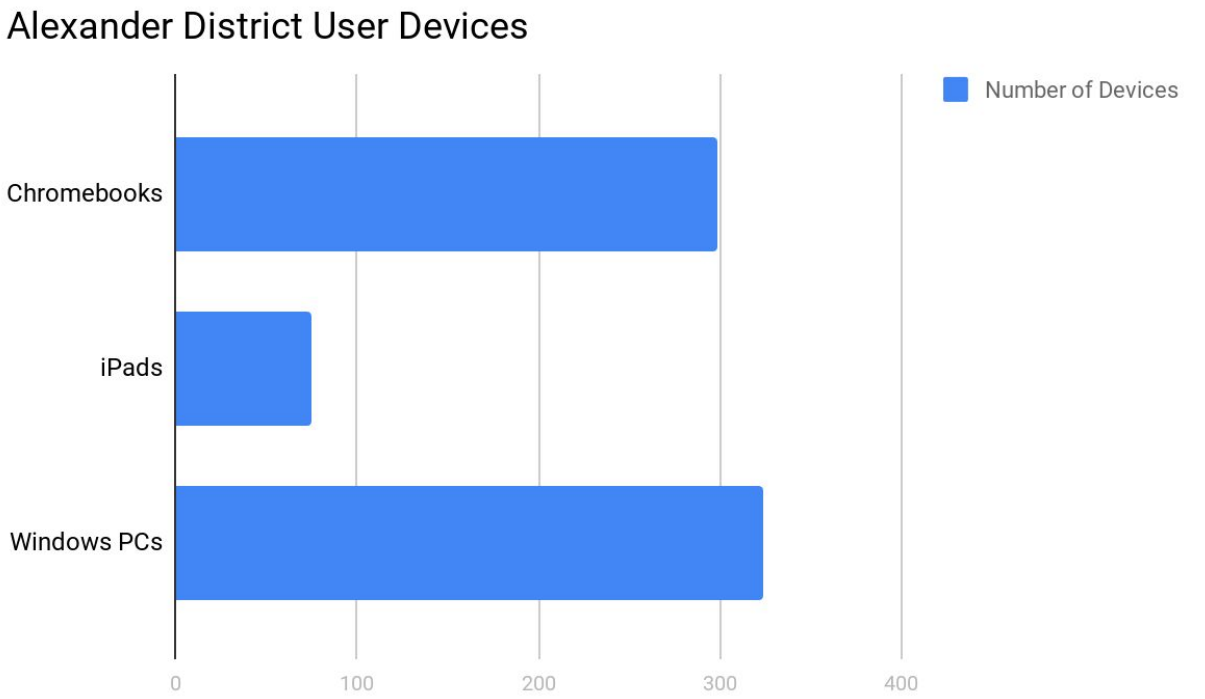
Goal 4 Expansion of Security camera system.

- Essential Question: how many cameras are needed and at what quality to provide the best security for all district stakeholders
- Objective: Identify the correct security cameras and locations. Upgrade or replace security camera sever to accommodate the extra recorded data. Train the IT Coordinator, Building Principals, School SRO and Assistant Principal in the operation of Security Camera Software
- Strategies/Activities: Training sessions on Security Camera Software with the vendor.
- Inputs: Training in Security camera software to all principal viewers in each building with the goal to make them turn-key trainers to any future employee with the need to view security footage.
- Evidence: Post-training surveys
- Responsibility: Technology Coordinator
- Timeline: Summer of 2019

Hardware:

The district has gone through a lot of changes over it's last 3 year technology plan. With the completion of Alexander's first Smart Bond plan that gave the district WiFi throughout the entire school district, mobile devices like Chromebooks and iPads are becoming the dominant devices in the district for student use. Windows PC's are still the preferred devices for running the interactive classroom equipment and office staff within the district. Where in the past the entire district's technology only consisted of Windows PCs, the next three years will have a school network with Chromebooks, iPads, and Windows PCs each filling specific niches where they are most useful.

User Devices:



Chromebooks:

Over the previous 3 year technology plan the district's amount of mobile devices have grown. In the 2015-2016 school year the district owned 30 Chromebook devices. As of July 1st of 2018 the district now has 299 Chromebook devices for student use between the 4th through 12th grades. The district has identified the Chromebook as the main focus for student use from 2nd Grade to 12th grade in the next three years.

Chromebooks have some unique characteristics that make them ideal for student use in the Alexander School District.

- Cost: Chromebooks cost less than a half that of a Windows PC. The price difference

allows the district to provide more than twice as many user devices for student learning with the available budget for hardware from year to year. Already since the 2015-2016 school year the district's available user devices has grown from 370 devices to 698 at July 1st of 2018. This growth has had a lot to do with the affordability of Chromebooks with hardware budget that has not changed much in three years.

- Google G-Suite accounts: The district has been using Google G-Suite for 6 years with it's staff, and has expanded that use to it's students from 4th grade to 12th grade giving each student in said grades a Google G-Suite account. Chromebooks require a Google G-Suite account to allow the user to login and use the wide arrange of tools that come with the account. Combined with their G-Suite account a student can access their Google Drive cloud storage, Google Docs, Slides, Sheets and many other applications easily. This allows for a similar experience on any Chromebook used in the district making training on it's use an easier endeavor then using devices with different operating systems and different installed applications like what you find on a Windows PC.
- Mobility: Chromebooks are light, have long battery life between charges, and need no cords to operate. With the completion of Alexander's first Smart Bond Plan in the 2017-2018 school year, the district now has complete WiFi coverage in every building. Learners can operate Chromebooks anywhere in the district. This gives students and teachers more flexibility with what they choose to be their teaching environment

iPads:

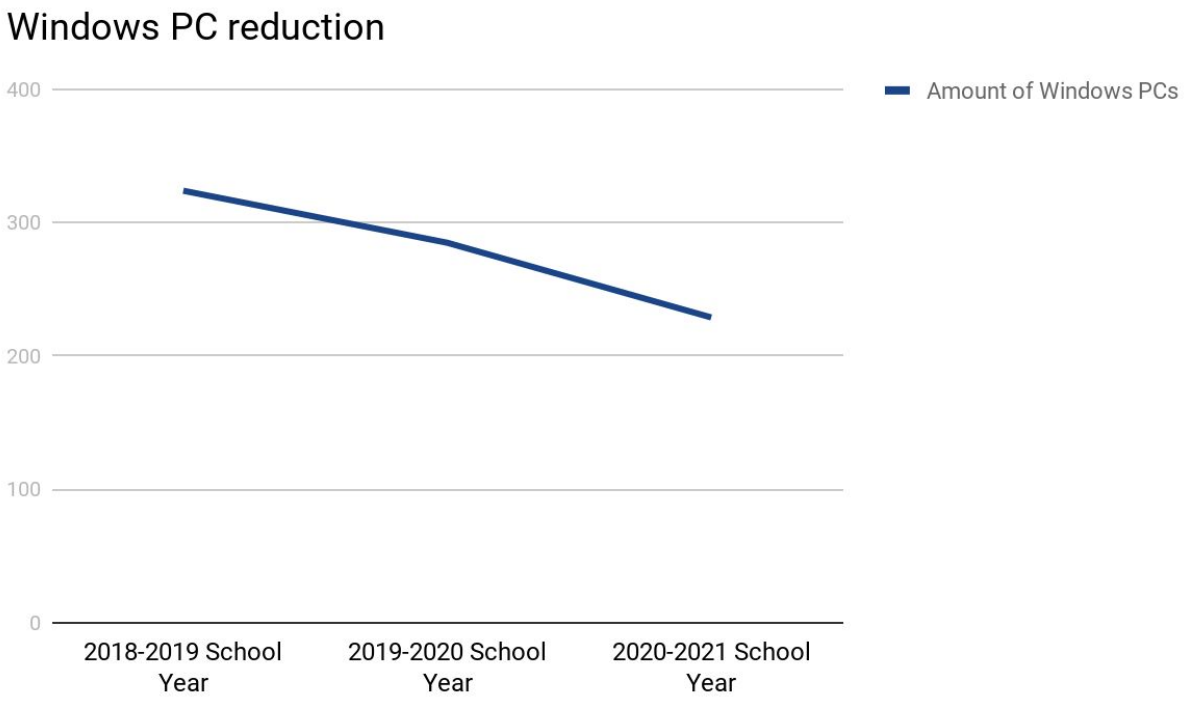
The district has identified Kindergarten, 1st grade, and many or our Special Education classrooms as areas where iPads are a better fit for our learners and their teachers. The amount of iPads in the district as of July 1st 2018 is 75. Kindergarten and 1st grade use iPads for center focused teaching. Special education rooms use iPads to meet individual student IEP requirements, and for their regular classroom curriculum. 10 of the iPads in the district are from a Physical Education PEP grant between Alexander and the Pembroke School district and are used in Physical education classes from the Elementary school through the Middle and High Schools. The district plans to stay at around 75 iPads through the next three years. The unique characteristics of iPads that make them valuable to these areas are:

- Tablet Devices: the iPads are tablets with a touchscreen and lack the complicated touch pads and keyboards of the other devices in the school. Are younger learners and certain students who need help with motor skills can use the iPads with greater ease then a Chromebook or Windows PC.
- No login: Our district iPads do not require a login to operate. This allows the user to simply click on the icon for an app that is related to classwork.
- Specific apps: iPads have access to the largest app store for any device. Many of these apps are designed for age groups and students with special needs that have access to iPads in the district.
- Mobility: Like the Chromebooks, the iPads are light and can utilize the district wide WiFi we have in Alexander.

Windows PCs:

The district has been using Windows PC's in it's classrooms and labs since it started it's IT department. Windows PC's tend to cost more than Chromebooks and for this reason we will

see a reduction of the amount of Windows PC's in the district over the the time this three year plan covers. The district plans to eliminate the Middle School stationary computer lab in the summer before the 2019-2020 school year. In the 2018-2019 school year we are removing 8 of the 12 Windows PC's in the library in favor of a Chromebook cart of 28 devices. Many of the PC's in the classrooms will also be removed in this school year, leaving 1 PC as the teacher's station and the computer that operates the classroom interactive equipment like displays and Smart Boards. Although the district is reducing the amount of Windows PC's it has, there is still a place for the PC over the next 3 years. The district Windows PC's are required for specific applications. These devices will continue to be used by our offices, CAD lab, and single teacher workstation that runs the classroom interactive hardware.



2018-2019: The district will remove about 8 PCs from the library.

2019-2020: The district plans remove its stationary Middle School lab and will retire it's oldest mobile laptop cart from the Elementary school. Both of these labs will be replaced by Chromebooks.

2020-2021: The district plans to to remove the Elementary stationary lab and replace it's last laptop cart with another Windows PC laptop cart. By this year, each classroom will have only one Windows PC per room used as a teacher workstation and to run the classroom's interactive Displays.

Over the span of this 3-year technology plan the district will see the reduction of at least 95

Windows PC's from the district.

Interactive Classroom:

The district has 63 classrooms that have interactive classroom hardware. All but 4 of these classrooms have a SMART Technologies SB-680 77" Smartboard is their main display screen and interactive whiteboard. The Smartboards were purchased over a two year span starting nine years ago. In the 2014-2015 School year, the district replaced the Dell 1200 projectors that had been used with the Smartboard from the beginning with Epson Powerlite series short throw projectors and boom arms to remove the projector carts and cords that spanned 8 feet from the boards. That upgrade prolonged the use of the Smartboard but coming up on ten years old they are beginning to show their age with circuit logic board failures. Additionally, the older single touch technology is not compatible to the multi touch nature of modern touch screen applications. For these reasons the district has made it a goal to replace these older units and keep the interactive classroom model.

The district already has 5 Interactive 70" display televisions purchased for new classrooms or in replacement of a failed Smartboard. With vendor loaners to examine, and the districts technology committees input we have come to the conclusion that 70" interactive displays are the logical replacement for the districts aging fleet of smartboards for the following reasons:

- 70" is the correct size for viewability by all learners in the classroom. Anything smaller becomes hard to read from the back of the classroom, and anything larger is to expensive as of 2018.
- Modern Display televisions have multi touch technology which are compatible with modern touch applications and have smart recognition of touch size for easier use by the teacher and student. Multi touch will also allow for more than one user to use the board at a time, something that is impossible with our current hardware.
- The display televisions we are looking to for replacement are compatible with the SMART notebook software our teachers have used for the last nine years. This makes the new device immediately useable with minimal training. Saved work done by teachers on this software will continue to work on the new Display television.
- Unlike the Smartboards in the district a Display television does not need to be aligned to make sure the board registers the touch with were it actually is occurring. As our Smartboard age this alignment procedure has to be done sometimes multiple times a school day.
- Display televisions have no shadows from the user and are brighter than projection units used with Smartboards.

This technology plan has made the replacement of our Interactive classroom equipment a goal for the 2018-2019 school year and will seek the funds for this project through our second Smart Board investment plan with the approval of our technology committee and its stakeholders.

Sound Amplification:

Sound amplification is important for the interactive classroom model. Students need to hear the teacher, video, application, or any other presentation in the classroom. In almost all of our classrooms this amplification is handled by the Epson Projector unit and its built in mono loudspeaker. The district is looking for display televisions with quality speakers for our plans to replace the Epson projectors used with the current Smartboards. Since this is a priority, if the right sound amplification can not be provided by the internal display television speakers, then external speakers will be purchased for each classroom of the district.

Whatever sound amplification is chosen should have external inputs to allow for a microphone or other technology not planed for at the time of the writing of this plan.

Infrastructure:

Wiring:

In the district's first Smart Bond plan, finished in 2018, the district had Cat6a network cable run to each classroom, office, and common area in the Middle School, High School, and Elementary buildings. Previously, in the 2001 building project, Cat5e cabling had been run to each of the districts rooms and this was how we provided network connection throughout the district. The bandwidth difference upgrading from Cat5e to Cat6a can be seen in the chart below:

Cat5e vs Cat6 vs Cat6a						
Cable Rating	**Frequency**	**Data Performance**	**Channel Length Limit**	**Max Data Speed**	**Length Limit at Max Bandwidth**	**Comment**
Cat 5e	100MHz	100 Mbs	100M	1 Gbps	100 m	Can handle 1G Ethernet
Cat 6	250MHz	1 Gbps	100M	10 Gbps	37 m	Can handle 10G Ethernet for lengths up to 55 meters depending on cabling quality and installation practices
Cat 6a	500MHz	10 Gbps	100M	10 Gbps	100 m	

The district chose to not use Cat6 wiring because its length limitations. This left Cat6a as the clear choice to upgrade our wiring infrastructure for use with WiFi. It's bandwidth and speed over distance allowed us to use the current wiring closets in the school buildings. Like Cat5e, Cat 6a can be run to a distance of 100 meters without loss of bandwidth. This distance allowed the district to make no major changes to where it's wiring closets were located which would have been an expensive change. This infrastructure upgrade should serve the district for over a decade or more for it's bandwidth needs.

Fiber Lines:

In the districts first Smart Bond project the Single mode and multi mode fiber optics that run between the High/Middle school building and the Elementary building were upgraded to

allow the Elementary to receive a 10 Gbps connection to the server closet located in the Middle School. This was an upgrade from 1Gbps which was the previous connection speed to that building. 6 pairs of single mode Fiber optic line and 12 pairs of multi mode fiber optic line where upgraded to allow for better connection to not just the school's network, but also to security cameras and to the districts IP phone lines with more available connection for growth in the future.

Because of switch upgrades in the 2018 Smart Bond project, the district is running at 10 Gbps between it's wiring closets in each building using the older multi mode connections inside each building. However these connections are old and need new modern termination connections installed. For the 2019-2020 school year the district is looking to upgrade these multimode fiber connections by running either single mode fiber to each edge closet, or just by upgrading the current multimode fiber terminations. Depending on the cost the school may use its own funds for this or a Smart Bond might be written for this infrastructure upgrade.

Switches:

The district currently has 23 switches distributed to one server closet and 6 switch closets. The closets are positioned where they are because of limitations in how long wiring can be run from a switch to a device or access point. Currently the districts closets locations are adequate for wire runs and security and there are no plans to change their locations in the scope of this 3 year technology plan.

The districts wiring closets are shown in the chart below:

Closet Name	Service Area
Bus Garage	All of Bus Garage
HS Closet A	Main Server Closet for District and Switch Core Stack. Also houses Security Cameras and IP Phone System. Serves Middle School and Main Office
HS Closet B	Bottom Floor of High School
HS Closet C	Main floor of High School
HS Closet D	Second Floor of Highschool
ES Closet A	Main Switch Stack of Elementary Building. Houses IP Phone System for Elementary. Serves East Wing, South Wing, and Downstairs Floor.
ES Closet B	North West wing of Elementary

During the districts first Smart Bond plan in the 2017-2018 school year the district added 11 switches to both provide Power over Ethernet to the whole district for powering Access points to provide WiFi through the district, and to replace older switches. This has left 11 switches in the district that are older with a clear focus on 6 switches that we are looking to replace within the span of this three year technology plan. The following bullet points identifies all 6 of these switches and the time frame for replacement.

- Bus Garage: The main switch in the bus garage only needs to be an 8 port switch to feed the 3 stationary computers there and the 1 Access Point. Plans are to replace this switch in the 2019-2020 School year
- Closet B,C,and D in the High School each have the same older switch in each closet. Each of these switches is currently a 48 port switch. The plan is to replace these in the 2019-2020 School year. The tech committee along with the schools IT department will decide by the end of the 2018-2019 school year whether these switches will need to be replaced by 48 port switches or smaller 24 port switches.
- Closet A in the HS and Closet A in the ES each have the same model of a 48 port switch. These need to be replaced in the span of this 3 year technology plan. We are looking at the 2020-2021 school year to replace these 2 switches

The district currently has enough power over ethernet ports for its needs. The one growing need for POE ports is security cameras. The district does not see a need for POE ports for WiFi Access Points or Phone systems in the span of this three year technology plan. Any of the 6 replacement switches may need to be partially power over ethernet ready to sever the need of more security cameras in the district.

NYSED Initiatives Alignment

Supporting rigorous academic standards attainment and performance improvement for students:

Our district goals focus on engagement and the development of a technology infrastructure as a means to create the conditions for student success. These goals permeate our Professional Learning Plan which includes a focus on instructional technology. Currently, we have Chromebooks, iPads, and Windows laptops deployed strategically throughout our buildings. Our next steps will include a professional learning effort related to how technology can enhance and enrich conditions in the classroom which will result in increased student achievement. Tools such as google classroom for collaboration, NewsELA for differentiated instruction, and Google Docs to promote sharing and collaboration both student to student and student to teacher are currently used and will be supported as teachers move toward a deeper level of application.

Supporting individualized learning needs for students with disabilities:

Chromebooks and iPads are used for instruction by students with disabilities and their instructors. Differentiated instruction will happen through software like NewsELA, and apps for the iPad that the students can use for technology and CAD training. Programs on the

Chromebooks like Read&Write for Google Chrome allow students with reading and writing needs to be accommodated. This software is also used to help students with disabilities type rather than orally respond for testing. Long response questions in testing are also accommodated with technology in the district using Chromebooks and Read&Write. Applications in iPads specific to target students with specific needs, like iPad apps for instructional technology that teach how gears move. Instructors can monitor multiple choice questions in real time for teacher interaction.

Equitable access to instruction, materials, and assessments occurs at the class level with class lesson plans and the anytime/anywhere access to technology like iPads and CHromebooks with the district wide WiFi access. Technology is used to provide additional ways to access key content, such as providing videos or other visuals to supplement verbal or written instruction or content. Text to speech and speech to text software like Read&Write is utilized to provide increased support for comprehension of written or verbal language. Learning games and other interactive software like assistive technology are used to supplement instruction.

Professional development is offered to teachers of Students with Disabilities that will enable them to differentiate learning and to increase their student language and content learning with the use of technology. Technology is used to support

- Writers in the elementary and secondary classroom.
- Research, writing and technology in a digital world is taught.
- Reading strategies and enhancement of of children's vocabulary.
- Technology to differentiate instruction in the special education classroom.
- Technology to increase options for students with disabilities to demonstrate their knowledge and skills.
- Promotion of model digital citizenship and responsibility.
- Integrating technology and curriculum across core content areas.
- Helping students with disabilities to connect with the world.

English Language Learners/Multilingual Learners:

Instruction for English language learners is laid out in the districts CEEP 2018-2019 ELL plan. However with access to the same Chromebooks and iPads as well as G-Suite accounts and Windows labs, our English language learners use technology to provide additional ways to access key content, such as providing videos or other visuals to supplement verbal or written instruction or content. Text to speech and speech to text software like Read&Write is utilized to provide increased support for comprehension of written or verbal language. Home language dictionaries and translation programs are provided through technology and Learning games and other interactive software are used to supplement instruction.

Technology in the district is used to addresses the needs of English Language Learners/Multilingual learners to ensure equitable access to instruction, materials, and assessments in multiple languages. The Alexander School district works closely with the districts full time ESL teacher to provide professional development that will enable them to differentiate learning and to increase their student language and content learning with the use of technology. These would include Reading strategies, electronic communication and collaboration, promotion of digital citizenship and responsibility, as well as Integrating

technology and curriculum across core content areas.

Culturally-responsive instruction and learning environments:

The district uses instructional technology to facilitate culturally-responsive instruction and learning environments by:

- Strengthening relationships and connections with families to assist in building a culturally responsive learning environment to enhance student learning.
- Developing and organizing coherent and relevant units, lessons, and learning tasks that build upon students' cultural backgrounds and experiences.
- Assisting in varying teaching approaches to accommodate diverse learning styles and language proficiencies.
- Enabling students to communicate and collaborate with students in different schools or districts in New York State, the United States, or with different countries.

IT Department:

The district's IT department currently consists of it's IT Director and a .4 shared tech from WFL BOCES Edutech. The Shared tech works with the district on Mondays and Tuesdays each week. This model has been in place for about 18 years. New To the district in the 2017-2018 school year is the position of Director of Curriculum and Instruction. This position does some work with teachers to help the IT department with instructional support along with their other district duties.

Future outlook:

The district may have to increase the support to the IT department when it goes to a 1:1 model for Cromebooks to each student. The increased amount of equipment may require additional staff to keep up with maintenance and user needs. This may be accomplished with the increase of Shared tech time in the district or the hiring of an additional tech to the district, however more time with a shared tech would be less expensive yearly and should provide the additional support needed.

This document was prepared by: Matthew Perry, Director of Technology for the Alexander School District with consultation from the districts technology committee and the districts leadership team. Documents like the Acceptable Use Policy, the District Cyberbullying Policy,

Parents Bill of Rights, and the districts Smart Bond investment plans can all be found on the IT Department page of the district website: IT Department Page
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